Vol. 131, No. 6 DECEMBER, 1929 Price 25 Cents

# AMERICAN GAS JOURNAL

*Established 1859 Pioneer of the Gas Industry*

Including · GAS INDUSTRY · Est. 1900 ·

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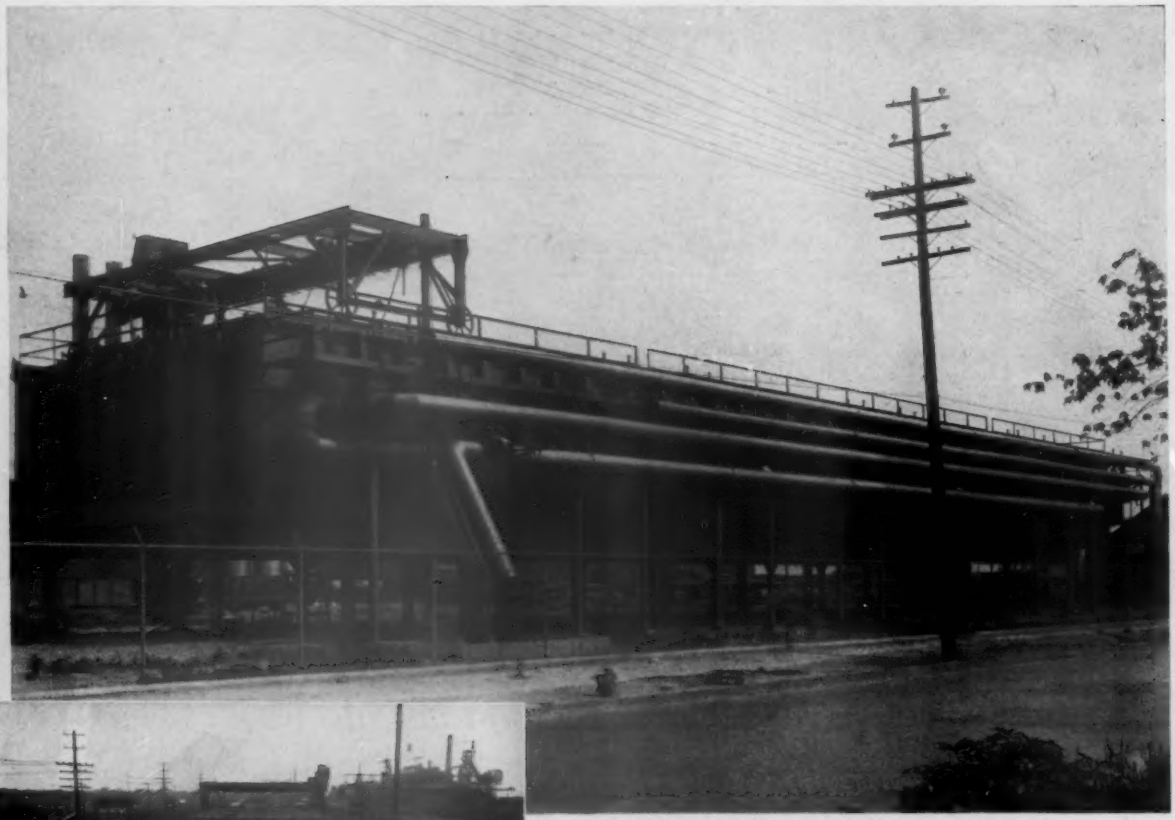
**Best Wishes**
for a
**Happy Holiday Season**
and a
**Prosperous New Year**

We thank you for making 1929
the record year

THE SPRAGUE METER CO.
BRIDGEPORT, CONN.

# Western Purifiers



Above, General view of Purifiers as built for Ohio Fuel Gas Co., Toledo, Ohio
At Left, Top view of high pressure boxes

"THE accompanying photograph illustrates an all electric welded steel purifier, having a capacity of six and one-half to eight million cubic feet. This purifier is 36′0″ wide, 120′0″ long, and 12′0″ deep. Circle series system of connections was furnished of all welded piping and "Western" double gate valves. The purifier is of the high pressure type and constructed for five pound working pressure and tested to seven pounds. The gantry crane is designed to carry the oxide elevator for filling the boxes. These boxes are elevated and are supplied with bottom dumps for discharge of oxide.

*Detailed Information Available Upon Request*

**THE WESTERN GAS CONSTRUCTION CO.**
**FORT WAYNE, INDIANA**
***Subsidiary of the Koppers Company***

AMERICAN
# GAS JOURNAL
*Established 1859* *Pioneer of the Gas Industry*
Including GAS INDUSTRY Est. 1900.

*Executive and Editorial Offices, 53 Park Place, New York City*

S. G. KRAKE, *President and Treasurer* A. M. GLEASON, *Secretary*

H. M. RILEY, *Editor*

R. S. MCBRIDE, *Consulting Editor,* Washington, D. C.

Vol. 131, No. 6 December, 1929 Whole Number 3672

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*53 Park Place, New York*

## THE STACEY MANUFACTURING COMPANY

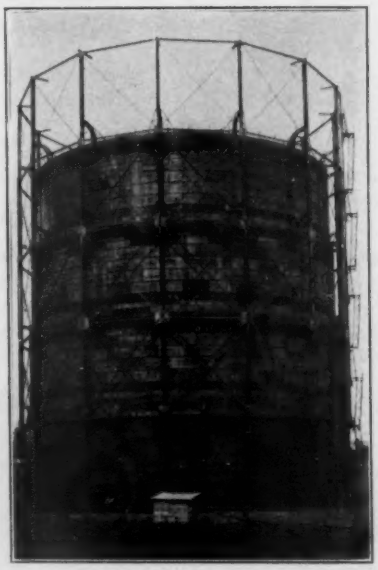
*The Builders of* STACEY *Gas Holders for Seventy-Eight Years*

# GAS HOLDERS

## GAS PLANT EQUIPMENT PURIFIERS STEEL TANKS

CAST IRON VALVES AND FITTINGS

WELDED STEEL PIPE AND FITTINGS

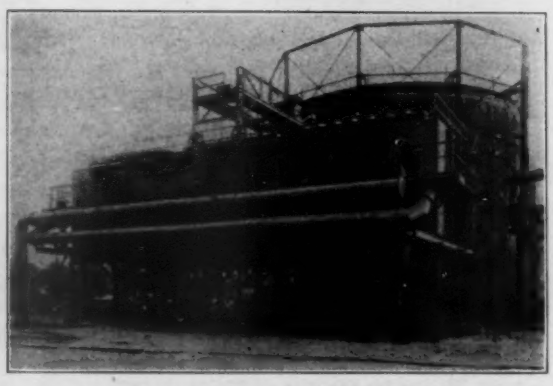


**Builders of More Than 1300 Gas Holders**

STACEY SINCE 1851

**Pioneer Builders of Low and High Pressure Gas Holders**

STACEY SINCE 1851



# THE STACEY MANUFACTURING COMPANY

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*Established* 1851 **CINCINNATI, OHIO** *Incorporated* 1880

New York Office: 52 Vanderbilt Ave. Telephone Vanderbilt 1549

# CONSTRUCTION WORK Undiminished for 1930

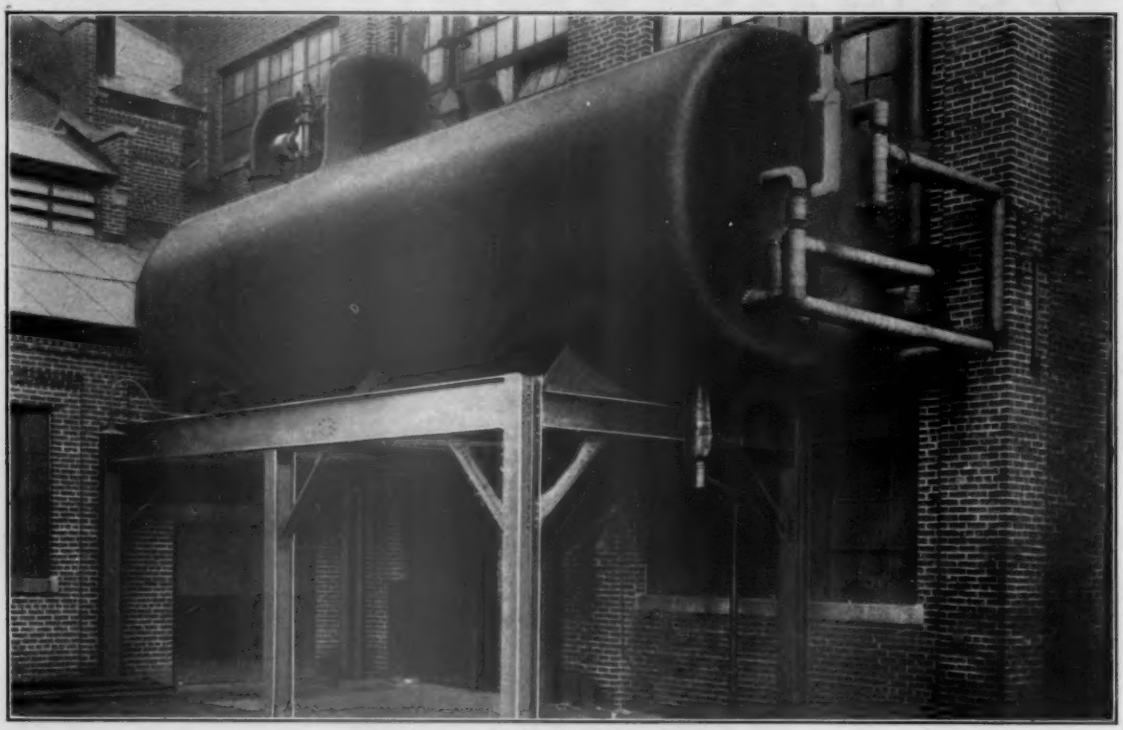
NATION wide attention has been directed toward maintaining construction programs previously prepared for 1930.

To carry out plans for work under consideration, estimates of cost, studies of results and operating costs and forecasts of returns on investment will be required.

We are equipped and are ready and anxious to co-operate with you in making your studies and plans for extension and remodeling of your plants.

SEMET-SOLVAY
ENGINEERING CORPORATION
*Division Allied Chemical and Dye Corp.*
40 RECTOR ST. NEW YORK

# SMOOT STEAM ACCUMULATOR



Smoot Steam Accumulator at Atlantic City Gas Co., Atlantic City, N. J.
The U. G. I. Contracting Co., Engineers.

**The Smoot Steam Accumulator quickly pays for itself in savings of high pressure steam and boiler fuel by**

1. Storing the exhaust steam from blowers and other auxiliaries, drainage from steam traps, etc., and employing this steam in the gas generators in place of high pressure steam from the boilers.

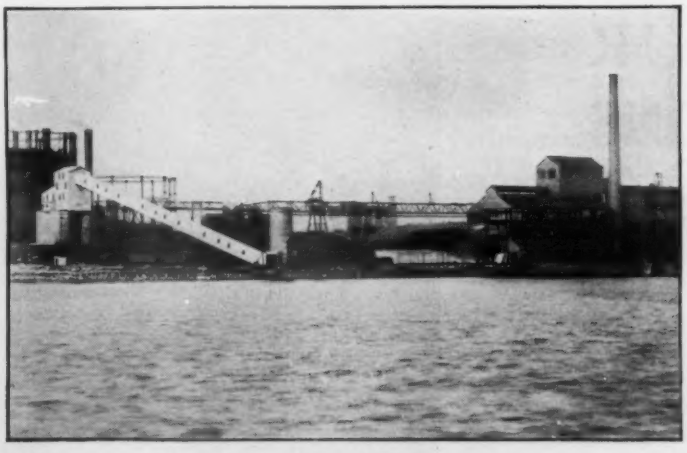
2. Delivering this steam to the gas generators at constant pressure by means of the accurate Smoot steam pressure regulator supplied with the Accumulator.

3. Acting as a water and oil separator so that the steam is clean and dry when delivered to the gas generators or the feed water heaters.

**SMOOT ENGINEERING CORPORATION**
**136 Liberty Street** **New York**

# SMOOT CONTROL

# U. G. I. VERTICAL CHAMBER OVEN



*Wisconsin Gas and Electric Company at Racine, Showing U. G. I. Vertical Chamber Oven plant*

## Average Operating Results

| | *Dubuque* | *Racine* | *Clinton* |
|---|---|---|---|
| Daily capacity — cu. ft. | 698,000 | 3,030,000 | 594,000 |
| Corrected Gas in cu. ft. per lb. of dry coal— | 6.44 | 7.64 | 6.85 |
| per ton of dry coal— | 12,880 | 15,280 | 13,700 |
| Heat units in gas per lb. of dry coal — B. t. u. | 3,605 | 4,005 | 3,721 |

THE U. G. I. Vertical Chamber Oven is the latest advance in carbonizing equipment for gas company use and offers these advantages:

Designed for the manufacture of gas with coke as a by-product
Produces domestic coke of the highest quality
"Steaming" gives dilution without addition of inerts
Flexibility of operation with coal gas heating
Low maintenance due to low operating temperatures, rugged construction and gravity discharge
Low labor cost due to simplicity of operation and regulation
High capacity per square foot of ground space

U. G. I. Vertical Chamber Ovens have been installed at Racine, Wis., Dubuque, Ia. and Clinton, Ia. and are under construction at Bangor, Me. and at Racine (second unit).

## THE U. G. I. CONTRACTING COMPANY

DIVISION OF

## UNITED ENGINEERS & CONSTRUCTORS

INCORPORATED

DWIGHT P. ROBINSON, PRESIDENT

Chicago — Broad and Arch Streets, Philadelphia — New York

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Ad No. 13 G ('29)

# COMPLETE GAS PLANT

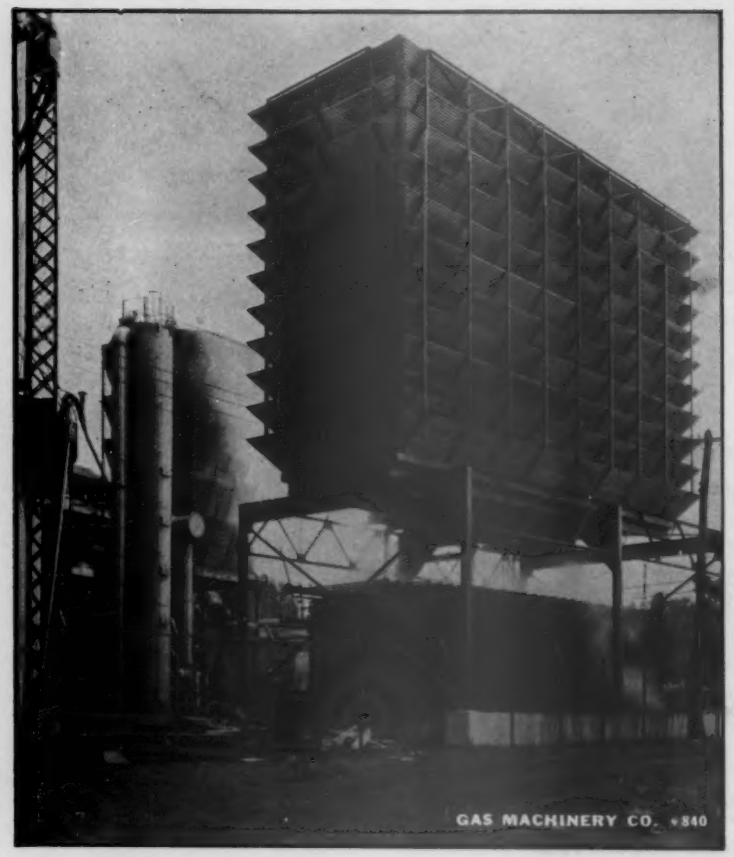
## TO OUR PATRONS

WE are coming to the close of one of the most successful years of our Company's history and wish to thank you one and all for the business which you have placed with us and the splendid cooperation you have extended in developing and installing your equipment.

Further orders will receive the same personal painstaking care and effort on the part of our entire staff and we respectfully request your future business.

### COMPLETE GAS PLANTS

A complete water gas plant recently constructed. It is typical of many of our installations. We provide equipment to best meet the requirements of our clients with a view to increasing the profit on the sendout by saving in the cost of production.




### COOLING COILS

One of our installations for cooling coils showing water cooling tower superimposed with the cooling scrubber, in the left background.

## PROD

- Water Gas Apparatus
- Coal Gas Benches
- Condensers
- Naphthalene Extractors
- Gas Oven Plants
- Benzol Recovery Plants
- Gas Producers
- Coal, Oil and Water Gas Plants
- Ammonia Scrubbers

# THE GAS MACHINERY C

# S—SPECIAL MACHINERY

THE pictures of the apparatus as shown on these pages serve to illustrate part of the equipment which we build.

We design and build apparatus and machinery to meet any requirement, with special attention given to making more uniform, efficient and economical the manufacture of gas.

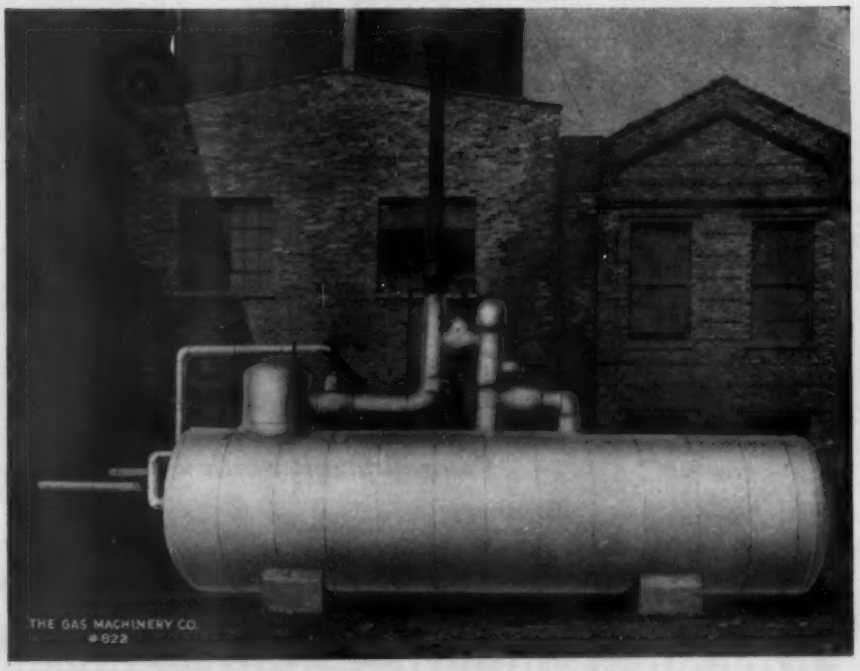
Our Engineers will gladly cooperate with your own engineering staff for a complete installation or any of its component parts.

## MODERN PURIFIERS

Our arc welded steel purifiers are complete in every detail. Special methods for charging and discharging the oxide, lifting and transporting covers and convenience in distributing the oxide to any part of the box are considered to make installations mechanically perfect.

## EXHAUST STEAM ACCUMULATOR

Recover exhaust steam for use as process steam, and the regulators control the pressure and quality of steam going to the generators. Hydraulically operated valves for existing apparatus, and complete new installations furnished. Also used as Tar Dehydrators. (Patent Applied For)




## U C T S

- Shaving Scrubbers
- Cooling Scrubber
- Cooling Scrubber Coils
- Tar Extractors
- Tar Stills
- Tar and Ammonia Washers
- Tar Dehydrators
- Power Driven Pressure Regulators
- Valves

# OMPANY—CLEVELAND, OHIO

# Why be Content with Less!

WE offer the services of our organization to Gas Companies contemplating repairs or additions to existing plants, or the erection of entirely new plants.

Our facilities and engineering ability, broad experience and accumulated data, extending over a period of more than twenty-five years enable us to handle successfully any project we undertake.

With our corps of well trained erectors under specialized direction, we can take any problem involving the production of coal gas and coke and the handling of coal and its by-products, and build for you a modern coal carbonizing plant that will prove itself to be the last word in operating efficiency, labor saving, economy and repair cost freedom.

*You will find it worth while to consult us.*

MAIN OFFICE — 24 STATE STREET,
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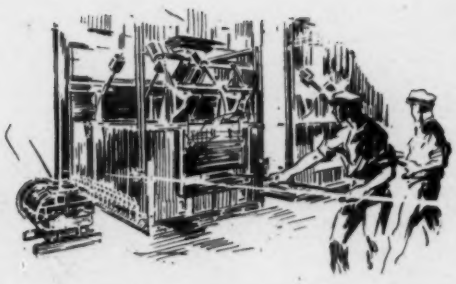
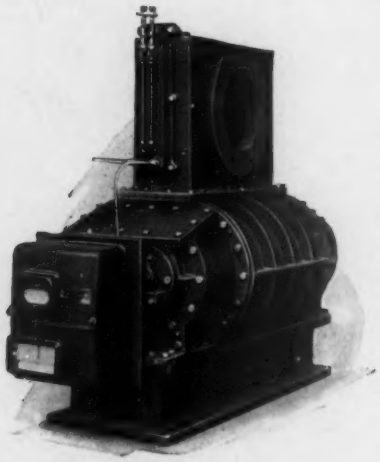
BRANCH OFFICE — ENGINEERING BLDG.,
205 WEST WACKER DRIVE, CHICAGO, ILL.

**IMPROVED EQUIPMENT-RUSSELL ENGINEERING CORPORATION**

*ENGINEERS* NEW YORK — *BUILDERS* CHICAGO

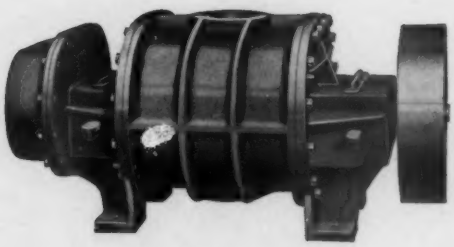
# Dependable Aids for your Industrial Installations





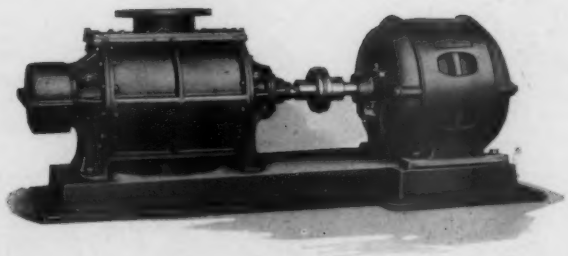
## Industrial Consumer Meters

A meter that is all metal with an unvarying non-adjustable displacement machined into it—the accuracy maintained throughout extreme variations in flow—large capacity in a single meter—easy to install—easy to read—free from the need of frequent adjustment or repairs. Description in Bulletin 4D and 305.



## Victor Rotary Positive Blowers

A positive supply of air from the Victor Positive Pressure Blower is an excellent aid to satisfactory gas burner service. There is a Victor Blower for any volume of air from 5 C.F.M. and larger. Bulletin 121 contains the ratings, R.P.M., power requirements, etc., of these Victor machines.



## Victor Gas Boosters

When your industrial consumer requires gas pressures at the burners, higher than are carried in the mains, a Victor Gas Booster will economically increase the pressure for this user, giving him a positive supply of gas that may be easily controlled at an even pressure. Bulletin 233 describes the special construction features of Victor Gas Boosters.

A post card or your name and address on the margin of this page, torn out and mailed to us in an envelope, will bring these bulletins to you.

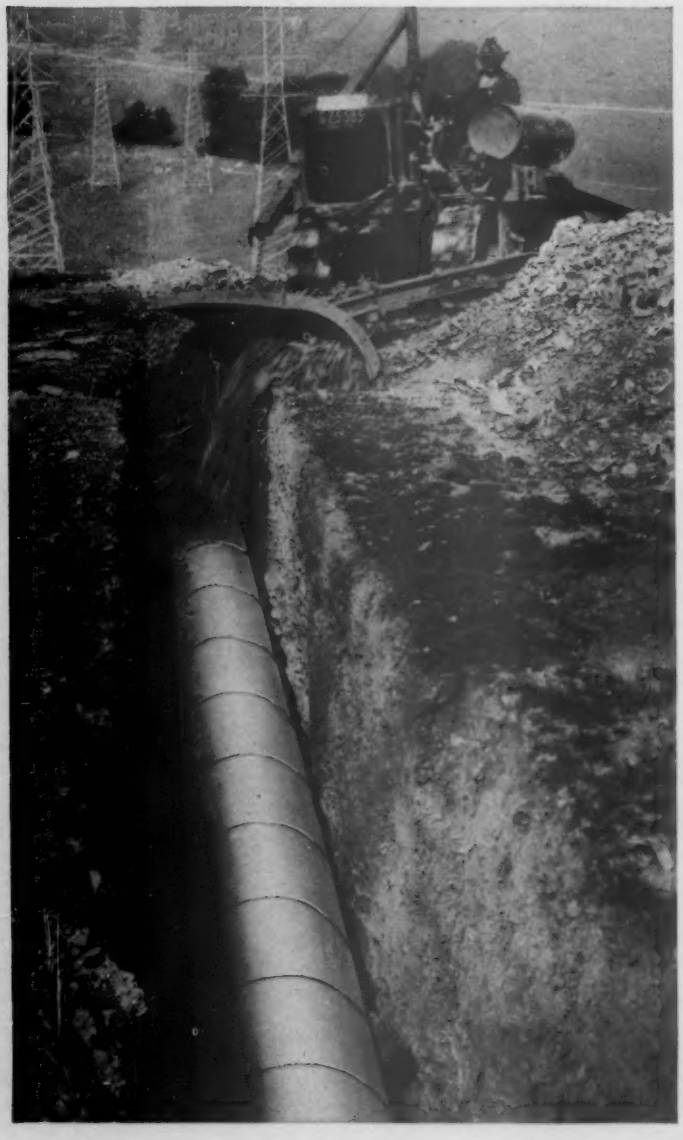
**The Connersville Blower Company, Inc.**
**Connersville, Indiana, U. S. A.**

114 Liberty Street, New York City, N. Y. — 53 W. Jackson Blvd., Chicago, Illinois. — Chamber of Commerce Bldg., Pittsburgh, Pa.

# CONNERSVILLE

Blowers • Gas Pumps • Meters • Cycloidal Pumps

# It's good common sense to guard your pipe line investment



The best precautions are none too good to guard your investment when the backfill takes it from your appraising eye, and it goes to work for you.

The best practice heretofore has been the hand coating of the pipe—in the field—with all the attendant difficulties of uncertain weather and labor to contend with.

Over 3000 miles of pipe laid during the past few months has been lowered into the ditch with the satisfying knowledge that every square inch had received uniform protection.

This pipe purchased through the mills listed below, was *mechanically* coated and wrapped *at the mill*, by the Hill, Hubbell & Co. process. It was delivered in the field ready for weld and backfill. It was bought, and is being purchased in increasing quantities by far sighted line operators who are anxious to gain maximum service from their new lines.

The Hill, Hubbell & Co. Machine Coating and Wrapping Process has been developed by the same group who for twenty-three years have specialized in protective coatings for metal. The location of their plants adjacent to six prominent pipe mills enables you virtually to write your own pipe life insurance policy at the time your order for pipe is placed.

We are prepared to wrap pipe up to 24-inch diameter, and to conform to any specifications as to the number of machine applied hot coatings and wrappings required.

Hill, Hubbell & Company Pipe Coating and Wrapping Plants are equipped to handle the production of the following mills:

CENTRAL TUBE COMPANY, Ambridge, Pa.; SPANG-CHALFANT & COMPANY, Ambridge, Pa.; YOUNGSTOWN SHEET & TUBE COMPANY, Indiana Harbor, Ind.; NATIONAL TUBE COMPANY, Lorain, Ohio; A. O. SMITH CORPORATION, Milwaukee, Wisc.; YOUNGSTOWN SHEET & TUBE COMPANY, Youngstown, Ohio.

## BITURINE COATINGS

*Biturine Enamel* — *Biturine Solution No. 5*
*Biturine Enamel Primer* — *Biturine 70-30*
*Biturine Coupling Mixture*

This group represents the fruits of more than 20 years of careful research and practical experience. Biturine Enamel and Primer are particularly adapted to the Hill, Hubbell & Company process of mechanically applying protective coating to the pipe at the mill.

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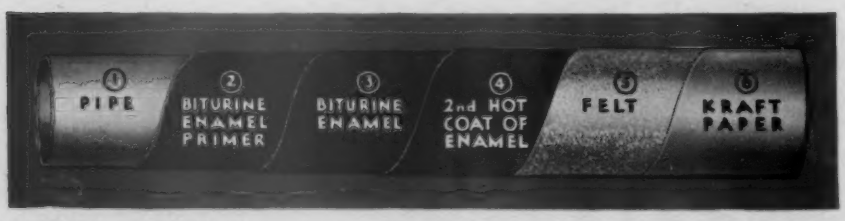
LOS ANGELES PORTLAND SEATTLE SPOKANE




*Hill, Hubbell & Company Machine Coated and Wrapped Pipe is Your Best Insurance Against Corrosion*

***Mueller Drilling Machine "D"***
**For drilling water and gas mains 1" to 2" inclusive, under pressure.**

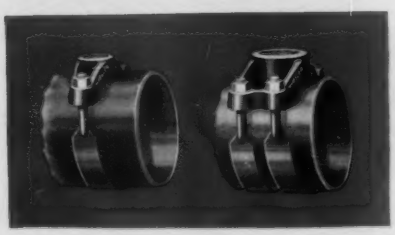
# *Mueller Service Clamps and Drilling Machines*

## The standard for 72 years

The overwhelming preference of leading gas companies for Mueller Equipment is significant testimony of the quality and dependability of products bearing the Mueller name.

Service is built into Mueller Equipment — enduring, dependable service that speeds-up work, turns out better jobs and reduces replacement expense. Every Mueller product is made of the finest obtainable materials by an organization backed by 72 years of successful manufacturing experience. Others have found that it pays to standardize on "MUELLER." A trial is convincing.

MUELLER CO. (Established 1857), Decatur, Illinois; *Branches*: New York, Dallas, San Francisco, Los Angeles; *Canadian Factory*: MUELLER, Limited, Sarnia.



# MUELLER

***Mueller Single Strap Service Clamp G-10450***
**Made of malleable iron galvanized. Satisfactory for gas or water services under all ordinary conditions.**

***Mueller Double Strap Service Clamp G-10494***
**Made of malleable iron galvanized. Should be used on installations where high pressure, severe climatic conditions or large services are encountered.**

# "INDUGAS"

## VERTICAL CHAMBER OVEN

*With Water-sealed Drop Door*

INTERMITTENT TYPE

## Minimum Labor
## Low First Cost

The annual operating reports of the Association of Swiss Gas Plants disclose that the "INDUGAS" ovens produce the largest yields of gas per ton of coal.

The following table shows the actual average yields from coal containing less volatile matter than the average American coal:

| City | Time | Yield cu. ft. per net ton | Heating value B.t.u. (gross) |
|---|---|---|---|
| Baden, Switzerland | 4 years average | 14075 | 560 |
| Olten, Switzerland | 2 " " | 13317 | 570 |
| Friedrichshafen, Germany | 4 " " | 16045 | 515 |

***There's a Reason***

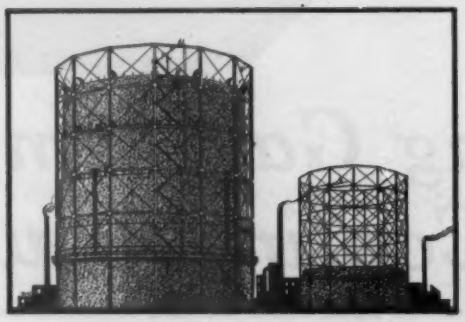
*Full information, layouts and estimates gladly furnished*

## INDUGAS COMPANY, Inc.

**114 LIBERTY STREET, NEW YORK**

# Our installations are designed and built with low operating and maintenance costs in view...Your savings over a period of years justify our use of the best materials and our care in figuring and erecting.

**Gas Holders . . . . Purifiers . . . Scrubbers . . . Tanks . . . Condensers**



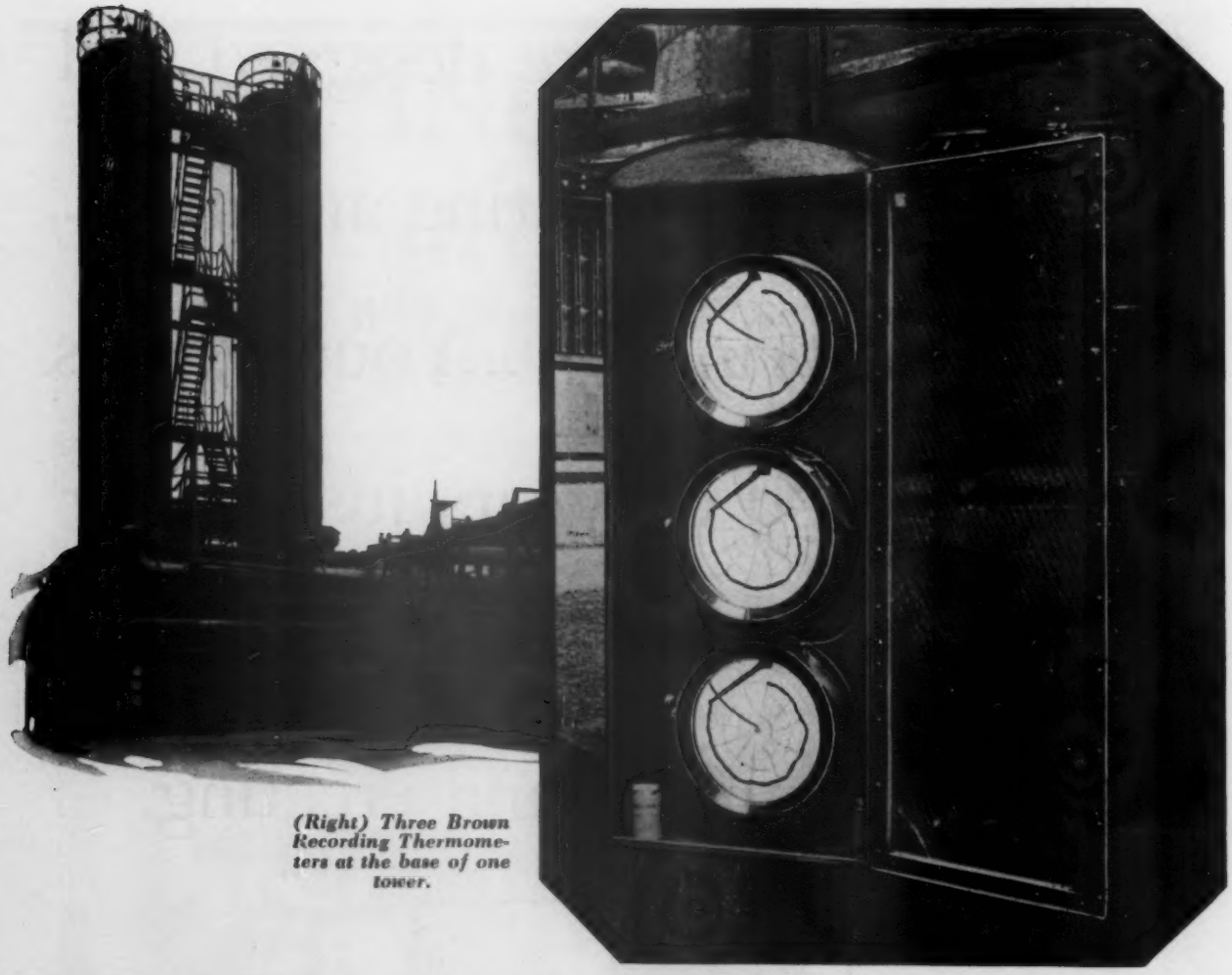
**High Pressure Tanks . . . . . Stacks . . . Flues . . . Pipe . . . Steel Plate Work**

Have our engineers submit a proposal for your next installation that requires experience with gas problems.

## CRUSE-KEMPER CO.

**AMBLER, PENNA.**

**Design that Fits the Purpose** | **Highest Grade Materials** | **26 Years of Experience**



*(Right) Three Brown Recording Thermometers at the base of one tower.*

# Controlling Gas Temperatures in Cooling Towers

THE three recording thermometers shown above are used to control the temperature of the coke oven gas which is cooled in the two large towers at the left. The instrument at the top records the temperature, of the hot gas in the main before entering the towers and the two instruments below record the temperature of the cool gas leaving each tower. In the proper operation of gas cooling units these records are indispensable. Write for Catalog No. 65 or recommendations for your particular problem.

**THE BROWN INSTRUMENT COMPANY**

**4473 Wayne Avenue, Philadelphia, Pa.**

*Branches in 20 principal cities*

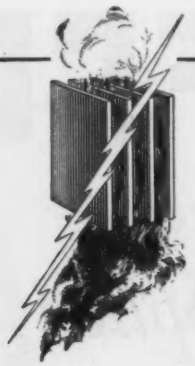
**SPEEDING UP DELIVERIES**

A 60% addition to our factory—an enlarged organization—improved equipment—are speeding up Brown Instrument deliveries. Get your orders in now.

**Pyrometers, Flow Meters, Recording Thermometers, Gauges, Liquid Level Meters**

# Brown Instruments

*"to measure is to economize"*



# COTTRELL

## ELECTRICAL PRECIPITATION PROCESSES

for the removal of

## DUSTS, FUMES, MISTS, TARS

and OTHER SUSPENDED MATTER from GASES

The following applications of the Cottrell Processes are established by satisfactory performance and the removals effected being only dependent on the Purchasers' requirements.

| | | |
|---|---|---|
| Carburetted Water Gas . . | 95%—99% | removal |
| By-Product Coke Oven Gas . | 95%—99% | " |
| Powdered Coal Ash. . . . . | 90%—95% | " |
| Carbon and Lamp Black . . | 95%—99% | " |
| Hot Roaster Gas . . . . . | 95%—99% | " |
| Sulphuric Acid Mist . . . . | 95%—99% | " |
| Contact Acid Gas Purification | 99% | " |
| Phosphoric Acid Recovery . . | 95%—99% | " |
| Miscellaneous Applications . | 90%—99% | " |

Our experience gained through the construction and successful operation of Cottrell Electrical Precipitation Process Installations of a total gas capacity exceeding 10,000,000 cubic feet per minute treating different types of gases enables us to intelligently study any new problem in gas cleaning. If our Process can be adapted, we are prepared to offer a complete installation guaranteed to effect the desired result.

Gas Detarring
Blast Furnace Gas Cleaning
Powdered Fuel Ash Removal
Carbon and Lamp Black Recovery
Asphalt Products Recovery
Non-Ferrous Metal Treatments

## RESEARCH CORPORATION

**25 West 43rd Street**
**NEW YORK, N. Y.**
Chicago Office, 343 S. Dearborn Street
Plant and Laboratory, Bound Brook, N. J.

Air Cleaning
Food Products Recovery
Paper & Pulp Mill Processes
Sulphuric Acid Recovery
Roaster Gas Cleaning
Miscellaneous Acid Recovery

# GREFCO

*is easily applied . . .*

*. . . for dipped joints*

*. . . for trowelled joints*

*. . . as a trowelled coating*

*. . . with a refractory gun*

*. . as a brush coating*

GREFCO Chrome High Temperature Cement is equally suitable for surface coatings, laying up brick, patching or general repair work. It is as easily worked as ordinary fire clay mortar. Does not settle in the mortar box.

For severe service conditions, particularly where the slagging action is severe and temperatures high, GREFCO will give dependable results.

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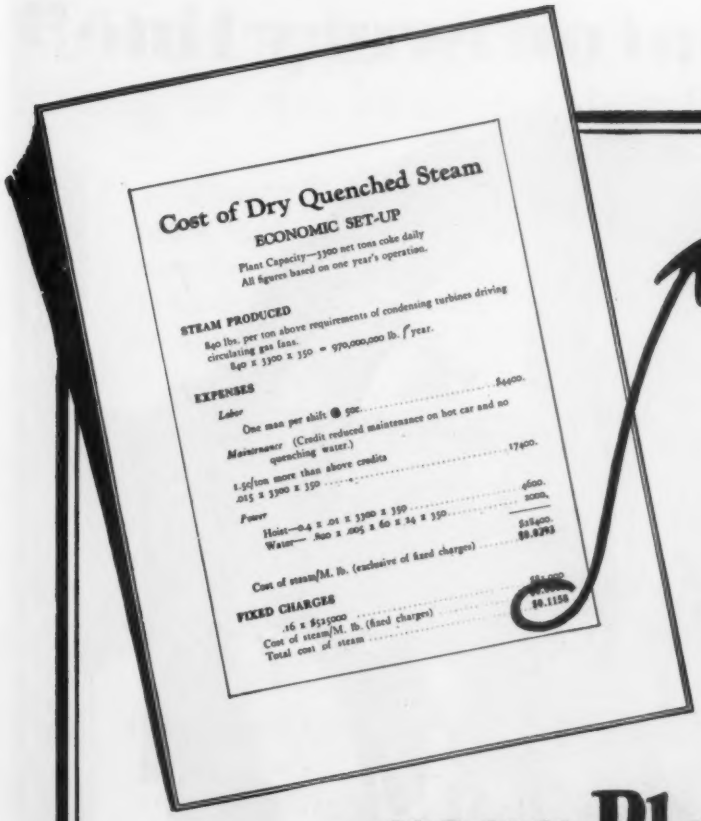
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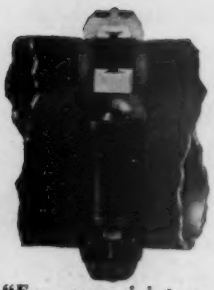

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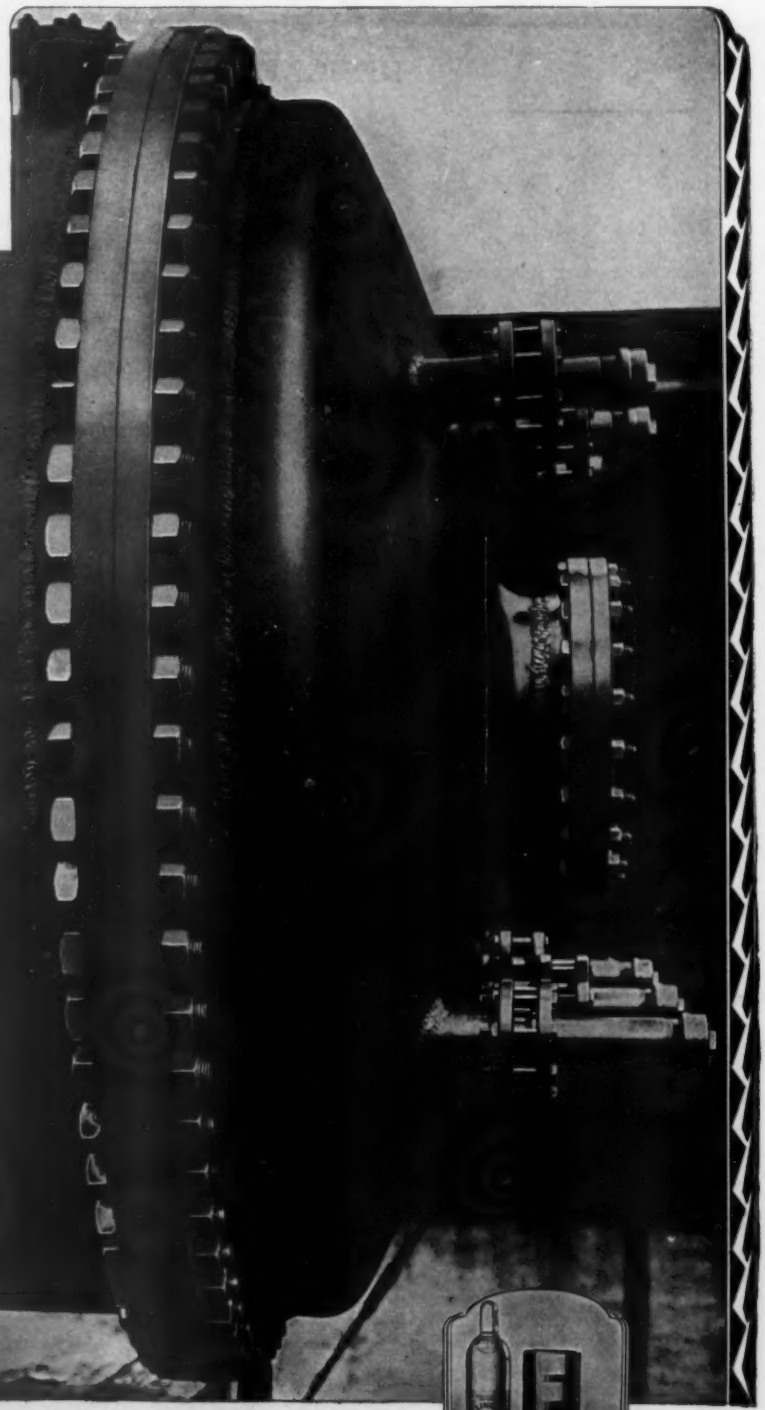

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HENRY M. RILEY, Editor

# An Optimistic Industry

EVEN THE MOST downhearted, if there are any of such creatures left in the Industry, will have to admit that the Gas Utility business has a tolerably rosy outlook. And, as far as the balance are concerned, they are optimists of the first water.

The Gas Industry has every right to view the future with optimism. This is based upon the fact that of late it has shown an uncanny faculty for taking its problems by the forelock and shaking them down to a right satisfactory solution. Moreover, the Industry is better equipped with brain power than it has ever been in its existence, and the public it serves has emerged from an attitude of reserved tolerance to a point where it is genuinely desirous of seeing the gas business prosper. The public has come to realize that its cultural and material progress is somehow rather dependent on the Industry's success.

Obviously, no undertaking ever attains perfection. There are always cropping up snarls and wrinkles that cause at least a trifle of temporary concern. For example, most of us are somewhat anxiously watching the course the domestic load is taking. But we can be assured that most of these watchers are thinking a bit ahead of the trend and accordingly this problem will be worked out to the best advantage. At all events, if the trend downward is unavoidable we can "bet our bottom dollar" that it will be revamped by other uses for gas and the gas range will still remain the old standby in the kitchen. We refuse to concede that any other appliance will edge it into the discard, regardless of how low the use of heat in the kitchen falls.

A snarl of more pressing moment would seem to be that which comes under the much-hackneyed title, "inferiority complex." Thus, we are at times inclined to inquire as to whether we really know very much about selling as compared with some competitive or other industry; we often search diligently for slogans to fill an erroneous gap that gas does not have the swanky appeal as, for instance, electricity, and so on. These are largely figments of the imagination. They deter rather than make for progress. And after all, we are no more encumbered with knotty problems than any other successful business.

Let us have done with "inferiority complexes." They have no place in an industry as basically optimistic as ours.

# An Urgent Present Duty of the Gas Industry

GAS MEN and the gas industry have a responsibility at the present time to aid in maintenance of general prosperity. Railroad executives, industrial leaders, public-utility officials, and other groups have been meeting with President Hoover to discuss the economic problems of today and the task which should be assigned to each one to stabilize business and insure a continued general prosperity despite the stock market collapse.

The general problem has been widely discussed and is generally understood. The specific problem of the gas business has, however, not been so clearly set forth. It is the duty of our industry to study the problem in its specific relationship to our own companies. As a part of that study *American Gas Journal* suggests a number of outstanding points that should be taken into account.

Stabilization of business demands first of all the elimination of waste. Extravagant spending has, therefore, no proper part in the scheme of things. The vital consideration is that continued employment shall be maintained for the vast majority of every community in order that the waste and the suffering incident to unemployment may be prevented.

Unemployment is the real basis of practically all of that economic loss which occurs during a period of hard times. The product of man's manual and mental effort that is not brought into being because man is unemployed constitutes a permanent loss to society, for the time, which he loses can never again be re-created. Hence, it is vital that the gas companies seek to give as large a measure of employment to those normally, or even those not normally, on their staffs as it is possible to give without wasteful spending.

In every plant and distribution system, in every office building, shop, or salesroom are jobs of maintenance and repair which need doing. Many of these jobs have been postponed from day to day, from month to month simply because there has been no convenient time to start them. The first and immediate responsibility of management should be to survey all of the property of the company for unattended repairs and see to it that these jobs are undertaken at the earliest practicable moment. Such repairs are usually largely a matter of labor. Hence they in a very large measure aid in solving unemployment problems.

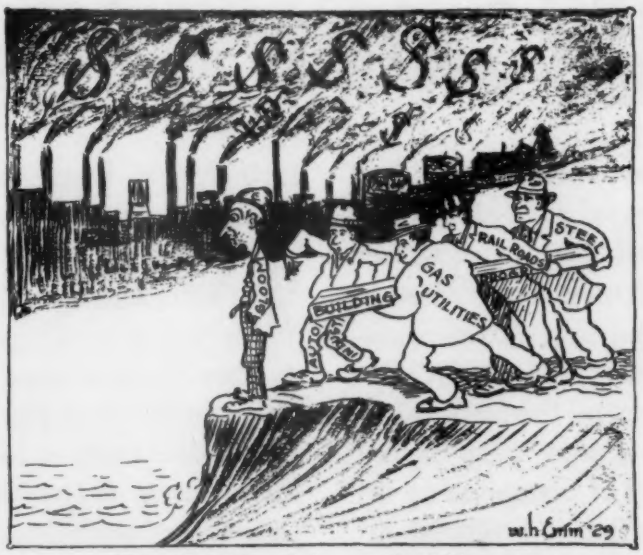
The second task of the public-utility management is to make a quick resurvey or bring up to date lagging surveys of the distribution requirement in present or prospective gas-using areas; an accurate determination should be made as to new feeder lines required, new governor or holder stations which will soon be necessary, extensions required for the new territory or enlargements required to serve territory of increasing demand. Such distribution surveys will disclose more work than can logically be undertaken either at once or during the coming season. Despite this fact, they should be made complete. They should then be used to determine a sort of order or priority of new work, much of which cannot be undertaken until spring, but all of which should be scheduled in the order of its importance to the community and the company. Then when the first days suitable for such work arrive plans will be complete, material will be on hand, competent employees will have been instructed, and the work can start promptly.

New office, shop, and permanent general facilities will in many communities form a third class of undertakings demanding attention. Consideration of this group of building projects should include a determination as to whether additional branch offices or more appliance salesrooms are needed by the company in order to serve the convenience of customers which now cannot readily reach the main office or existing branches. Also it will be important to determine whether greater efficiency could be had in distribution, in meter setting, or in handling of emergency and complaint work if there were an additional shop in another part of the town. All these projects must, of course, be judged primarily on the basis of their long-time contribution to company efficiency and to the adequacy of public service.

Even more radical revisions of fixed property may be required by some companies and these may form in their communities the largest part of the construction work which is likely to be taken up by the gas company for several years to come. A complete remodeling or actual replacement of present plant or plant equipment may be needed. The change may even go so far as to necessitate early decision as to whether or not natural gas may be brought from some relatively distant point to supplant the present manufacturing works. It should not be forgotten that pipe-line construction is just as logically a part of an employment and stabilization program as is building construction, main installation, or miscellaneous maintenance and repair work.

And finally, the gas companies will aid materially in improving general business conditions by an intensified merchandise and equipment sales program. There are

going to be, so many people think, a considerable number of expert sales persons out of employment because of the curtailed buying of automobiles, fur coats, radio sets, and other postponable luxuries. It would not be a bad idea for the gas company to strengthen its sales staff by adding an appropriate number of such individuals, if they actually become available as forecast. A man who makes a good automobile salesman ought to be able to sell fine household equipment, such as high-priced ranges, incinerators, automatic water heaters, and the like. In this price field he will be dealing with the same class of patrons who will be buying equipment for the same motives as prompt them to buy a good car instead of a cheap or used automobile. When such an appliance is sold we should recognize the fact that we are creating not only employment for the salesman and the installation fitter; we create far more than this in the way of employment stabilization, because there lie back of a hundred-dollar appliance a considerable number of days of employment of factory workmen who have built the device. The flow of equipment such as this from factory and through appliance salesroom into consumers' homes where it will give long-time efficient service is just as important in stabilizing business as is the task of keeping carpenters, bricklayers, or other artisans from idleness.




*Now, altogether—let's get rid of him at once*

Two great obstacles may lie in the way of prompt execution of programs for repair, extension, or remodeling of the gas industry's plants and facilities. One of these is the question of where to get the money. The second of these is purely psychological, a problem that can be met only by a sane point of view on the part of boards of directors and operating executives.

Money is now available in ample quantities for any sound constructive investment which is required by the gas business. This money can be had readily and at reasonable rates of interest. The huge sums withdrawn from call-loan markets are not all available for new unfunded debts or new bond issues of railroads, utilities, and industries. But a substantial part of this money will shortly become so available. Conservative bankers will be anxious to put their spare funds at work and conservative individual investors (perhaps this is the only kind left after our last few weeks of experience) are going to look to public utility bonds as a logical part of their investment portfolios. Public-utility earnings have never been on a more favorable basis. The credit of utility companies is excellent; and if it be wisely used, it is more than adequate to care for development and maintenance programs in excess of any which have prevailed even during the last few years of greatest prosperity.

The psychological factor in management is not easy to define nor easy to control. Too large a number of individuals in the investing class, including many who sit on our boards of directors, have lost either real or paper profits during the last few weeks. Many of these men will be tempted to vote for extreme caution in their companies' enterprises. Were it not for the corrective influence now being exercised by the President and the Federal Government there might be much to fear in this direction. However, our national engineer-president is showing the way. Executives who want to go along with the crowd will find it necessary promptly to forget the unfortunate happenings of the past few weeks and take a sane and optimistic view of America's permanent prosperity.

In the past few years, especially in the public-utility fields, being a bull on America has attained a distorted significance, implying speculation. That never should have been. One who believes in America's permanence, prosperity, and progress should do so without gambling. And he should do so with the supreme confidence in the correctness of his judgment that will enable him and others to work for the prompt undertaking and the efficient execution of those programs of maintenance, extension, and aggressive merchandising which are an essential part of the gas industry's participation in the good things ahead.

AT best the interchange of material gifts at Yuletide counts but little as humanity presses ever forward to higher standards and more peaceful, more pleasant modes of living. Far transcending the material aspect of this season is the mellowing influence of comradeship which always flames brightest at Christmas time.

IT is this attribute of cooperation and helpfulness which characterizes our Industry and is gradually making it an irresistible agency for furthering the happiness of the great multitude of customers it serves.

INDEED, the Industry waits not for this season to put into action its slogan, "Service"; it permeates its every action for the entire year. Moreover, it it has a dual meaning; helpfulness to the employee and customer alike. Progress and prosperity are invariably the rewards of an industry that charts its course in the direction of Service.

WE extend to all our heartiest wishes for

*A Merry Christmas*

# A Modern Plant Supplies the Increasing Demand for Pretzels

## A Brief History of a Homely Delicacy and the Application of Gas for Its Manufacture

***By Lawrence E. Biemiller***
Supervisor, Fuel Sales, Consolidated Gas Electric Light & Power Company of Baltimore

PRETZELS are more popular than ever. There are no government reports which prove just how popular they are, but the annual consumption must be a figure of Liberty Loan proportions. With the exception of the recent hybrid, the pretzel stick, and pretzels in the shape of fish and animals, all of these billions of pretzels are made in an identical and very curious pattern, a sort of figure eight, or double knot. Very few people who eat, or even make pretzels, know that this shape has a religious significance and strange history.

Pretzels seem to have first been made many centuries ago in what is now Southern Germany, in that region now known as the Black Forest. They were very popular with the peasants, who called them "bretzeln."

At first these pretzels were made and eaten only during Holy Week, their consumption being in connection with a religious ceremony of importance. Their curious shape, which was the same then as it is today, was to symbolize the ropes which bound Christ's hands, when he was being led to the Cross.

These "bretzeln" tasted so good to the peasants that they began to eat them at other periods than Holy Week, and their religious associations were slowly forgotten. The peasants had another great interest in life, and that was in their "bier." They soon found out that because of the salt on them, pretzels were particularly suited to be eaten with beer. Before long they thought of "pretzels and beer," just as the modern American associates "ham and eggs," and they completely forgot the original religious associations of pretzels.

A couple of centuries ago the Pennsylvania "Dutch" introduced the pretzel to the new civilization forming in America, and by their establishment of bakeries insured the perpetuation of its popularity. While this delicacy is now well known under the name pretzel all over the East, and to a lesser extent in the West, it still goes by the name of Bretzel in parts of the Keystone State.

Pretzels have always been very popular in Baltimore and it is quite appropriate that there should be a large modern factory which produces pretzels in Baltimore and ships them all over the United States.

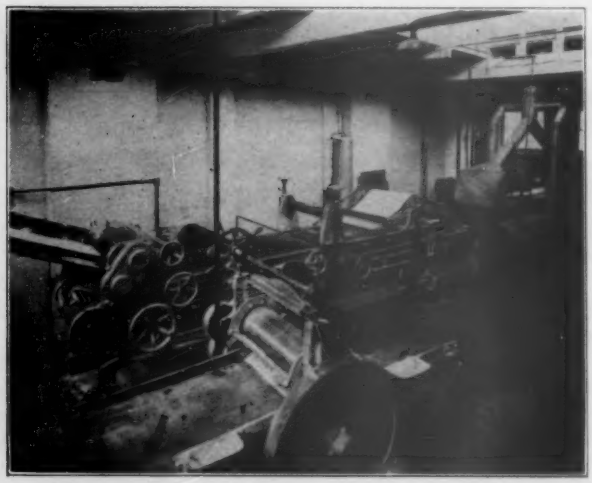
### Coal-Fired Oven First Used

In 1917, Mr. George H. Becker formed a partnership with another man, for the manufacture and sale of pretzels, starting with one small coal fired oven having a hearth about six by eight feet. At the end of the year, Mr. Becker bought his partner out and started the Becker Baking Company. In 1929 the name was changed to Becker Pretzel Bakeries, Inc., in order to more closely identify the organization with the only product which it baked.

As the original Company grew it was necessary to build additional coal fired peel ovens, but Mr. Becker soon saw the necessity of a modern plant. He dreamed of the day when he could produce pretzels in straight line production on a quantity basis, and could bake them in a modern gas fired traveling oven. The dream was

*Exit End of Gas-Fired Traveling Oven for Baking Pretzels*

realized before long, and in 1925 a completely new plant was built on the location of the old, which incorporated many advanced engineering principles not found in any other pretzel bakeries. This plant, pictures of which are here included, can best be discussed in relation to the various operations of a pretzel bakery.



*Dough Brake and Automatic Cutting and Panning Machine with Cooker*

First of course the dough must be made. The flour used is a special blend of Maryland and Pennsylvania soft winter wheat, and Western spring wheat. These wheats are purchased in large quantities and the blending is done in the Becker factory. This mixture of flours is sifted, aerated and automatically weighed into the mixer, where other ingredients, such as water, shortening, creamery butter and salt, are added. These ingredients are thoroughly mixed in a motor driven mixer, so that the resulting dough always has the same consistency.

The dough is first sent to a proof oven where it is kept at the desired temperature for from fifteen to thirty minutes. From here it goes to the dough break which gives it the homogeneity which permits cutting.

Handmade pretzels are twisted from a long thin strip of dough which has been cut by an automatic cutting machine and dropped on a conveyor which carries it past and within a few inches of the girl "twister." Of recent years a new form of pretzel has become popular, the "pretzel stick." This is a strip of dough, which may be similar to that from which a pretzel is twisted, or may be smaller. The twister places the "stick," or pretzel which she has twisted, on a pan, and when the pan is full she puts it on another conveyor, parallel to and about one foot higher than the dough conveyor. The pan is carried automatically through the coker.

Machine made pretzels, small sticks, and animals and fish shapes, are punched from a sheet of dough of the proper thickness by an automatic cutting and panning machine. This machine cuts twelve small pretzels or other shapes per cut, and makes about 135 cuts per minute. The individual pretzels are pushed out of the main sheet of dough by a series of fingers, and fall upon a pan which carries them automatically through the cooker.

The cooker is about ten feet long and contains a special solution, maintained at a temperature near the boiling point of water. The pans full of pretzels, or special shapes, are carried through it on a conveyor. This cooking aids in giving the finished pretzel the desired taste and crispness as well as the exterior color and gloss. These cookers were especially designed and built for the Becker Company through the cooperative work of Mr. Becker, a sheet metal firm, and engineers of the Gas and Electric Company of Baltimore.

From the cookers, conveyors carry the loaded pans under an automatic salting machine to the inlet of the traveling oven. This oven is seventy-five feet long and twelve feet wide outside. It accommodates four rows of pans and each row may be carried through the oven at a different speed simultaneously. The pans are twenty-six inches wide. The oven contains a total of ninety-six gas burners arranged in two horizontal rows. These burners are ribbon burners extending the width of the oven, one series below and one above, the pretzels being carried through. This results in an even temperature across the whole oven. Manufactured gas at a pressure of three pounds is supplied to the burner mixer and the air for combustion is injected. This results in a single valve control. The oven has thermo-couples at a number of points and a central indicating instrument at a convenient location. The temperature maintained varies from 510 on the inlet, to 275 on the outlet end of the oven.

Mr. Becker has found this gas heated oven most satisfactory. It has been in almost continuous operation, sometimes both night and day, for four years. There has been practically no repair work or maintenance necessary, with the exception of periodic cleaning of the burners and mixers. This cleaning is necessary more frequently than is usual in the case of the ordinary oven, because of the large use of salt. Such cleaning is usually done by the service men of the Gas and Electric Company which supplies the gas in the City of Baltimore. With such continuity of operation, and at the same time a perfectly uniformly baked product, at low fuel cost, Mr. Becker is an enthusiastic advocate of gas fired baking ovens.

*Automatic Cooker and Conveyor for Handmade Goods, with Gas Oven in Background*

When the pretzels leave the oven they are removed from the pans and accumulated in special baskets. These are put in a kiln for six hours, at a temperature of 148, and the desired crispness results. Then the

pretzels are ready for packing in the many different kinds of containers, for shipment.

The plant usually uses forty barrels of flour in a nine-hour day, with a gas consumption of about 40,000 cu. ft., and obtains eight thousand pounds of pretzels. Among the different pretzels made are animals, fish, three sizes of sticks, junior pretzels (machine made) and four sizes of handmade pretzels. If only fish or animals are made the daily production is 1,080,000 pieces, if junior pretzels, 832,000 pieces. With the larger handsome pretzels the number is proportionately less.

It was originally said that pretzels were more popular along the Atlantic seaboard, but Becker Pretzel Bakeries ship their pretzels over long distances by many different means. Much of their production is sold in Baltimore, where it is delivered mostly by wagon. Automobile shipments are made to Richmond, Washington, Newark and Philadelphia. Boat shipments are made to New England, Florida and Cuba. Rail shipments are made regularly to Chicago and Cincinnati, and sometimes to points as far west as Fresno, California. It is nothing unusual to ship a whole railroad car of pretzels to a single customer in one of the former cities. This single shipment weighs twenty thousand pounds, and if it contains junior pretzels, there are over two million of such pretzels therein. The Becker Pretzel Bakeries, Inc., can well claim that their pretzels are "Made in Baltimore," and sold everywhere.

This should all seem to prove that pretzels are still very popular. They are. Most cracker bakers discontinued making pretzels during the war and for several years afterwards, as they thought that pretzels naturally belonged with beer, and that one could not be sold without the other. But events proved otherwise, and the pretzel's popularity is growing very rapidly, so that more pretzels are made now than ever before. They are eaten by children, they are served with milk, ice cream or lemonade, at home or at soda fountains. Many Americans agree with the peasants of centuries ago in the Black Forest, that pretzels are too good to eat only one week in the year, and so they eat pretzels all the time.

## Establish Your Own Gas Research Department

All industrial leaders of today admit that research is producing remarkable results. The United States is forging rapidly ahead owing to the extensive research departments operated by practically all of our foremost manufacturers.

But why confine research solely to large concerns? Officials of the smaller companies seem to believe that research departments are only for the large establishments and that a small organization cannot afford such a department.

No doubt it is true that the small or comparatively small concern cannot afford an extensive research department for doing a great deal of experimenting. But why attempt to begin with a large one? A small one-man research department may be more efficient than a large one anyway. It all depends upon that one man.

Here is another suggestion: Every industry in the world, regardless of size, must buy as well as sell. Next time you buy, instead of asking for prices and selecting the cheapest, why not pick out the product that looks *best* and buy it even though it may cost considerably more than the cheapest? The difference in cost between the best and the cheapest may then be charged to "research". Or carry it a little farther and buy both—the one that looks best as well as the one that is cheapest. Compare the two side by side under identical conditions. Probably you will find that it pays very well to invest a little additional money in *quality* products instead of buying solely on a first cost basis. That is *Research* and it is a kind of worth while research that can be indulged in by any business institution regardless of size.—*W. F. Schaporst.*

## Calibration of Apparatus for Scientific Uses

Much of the value of scientific data depends upon the accuracy with which the data are known. In every scientific laboratory, therefore, it is necessary to calibrate accurately all measuring instruments used. Every laboratory group doing scientific research is not equipped for rapidly and conveniently turning out accurate calibrations of measuring instruments. Consequently, the Pittsburgh Experiment Station of the United States Bureau of Mines, Department of Commerce, maintains a calibrating laboratory fully equipped for rapidly and accurately testing the scientific instruments used in other laboratories at the station, such as thermometers, thermocouples, pyrometers, potentiometers, various electrical measuring instruments, cells used for measuring electrical potentials, pressure gauges, etc. The primary standards are usually obtained from the U. S. Bureau of Standards. Most workers do not wish to keep these expensive and often delicate primary standards in continuous service. Therefore, the calibrating laboratory establishes secondary standards from these for the use of the other laboratories of the station. During the past year the calibrating laboratory has rendered service to other laboratories at the station in the accurate calibration and checking of hundreds of scientific measuring instruments of many different kinds.

## Industrial Traffic Department's Importance in Plant Location Problem

A Western firm manufacturing gas fittings and plumbing supplies reported to the Transportation Division, in response to its industrial traffic management questionnaire, that its traffic department figured the following factors in connection with a proposed location for a new plant:

1. Tonnage production.
2. Territory of consumption.
3. Cost of transporting raw materials.
4. Cost of transporting finished product.

Its findings showed that a plant located at another point than the one proposed would result in saving approximately $100,000 per year in freight, and with no increase in taxes, light, or other items. This firm reports having had a Traffic Department since 1892 and says that "practically all waste was eliminated by co-operation years ago."

# The Pressing Machine Boiler

*By J. H. Bell*

Vice-President, P. M. Lattner Manufacturing Company

THE installation of a high pressure gas fired boiler to operate garment pressing machines presents no difficult problems to either the sales department or installation department if a few simple rules are remembered.

To the equipment salesman the first of these rules is "one and one," or one average garment press requires one boiler horse power. It then naturally follows that ten garment presses demand a ten horse power boiler, exactly. Anticipated falling off in efficiency of the steam boiler need not be considered, as the rating of "one and one" has been based on the ordinary life of the units. There is sufficient overload capacity in the gas fired boiler to compensate for this factor, as well as sufficient under demand from the machines to make life pleasant for the operator. The rating of one boiler horse power to one ordinary garment press can be taken for granted.

The next rule to remember is in regard to returns. If the boiler is placed on the floor below the machines, or in a pit of such depth that the water level is lower than the return outlet from the machines, a "closed" or "direct return" system can be used. If the boiler must be placed on the same floor with the presses, the water level would be too high for direct returns and some form of mechanical condensation return system would be necessary. However there are exceptions to this rule and the following apply.

### Question of Water Level

In the standard gas fired high pressure boilers on the market, the water level in the one, two and three horse power sizes is low enough to facilitate direct returns when the boiler is situated on the same floor with the machines. Also, a special low type boiler is built in certain rated capacities up to and including seven horse power with which the same results may be accomplished. This low type of boiler is appreciably higher in price than the so called standard types, but in most instances would be considerably cheaper in first cost than would a standard type boiler plus an electric condensation return system. On the other hand, the first cost saving would be considerably off set by the extra cost of operating a low type boiler, which boiler is approximately ten per cent less efficient than a standard type. This leaves room for argument dependent principally on the net cost of fuel in the locality where the proposed installation would be made. It would only be so in the horse power requirement field ranging from four to seven inclusive, as per the points previously mentioned.

When a boiler unit is sold which requires a condensation return system, such a system may be obtained from the same manufacturer who is to furnish the gas fired boiler. These systems vary as to size and capacity and are rated strictly to the job for which they are to be used. Horse power capacity of the boiler and maximum steam pressure to be carried are the determining factors and knowledge of these two points must be had before the manufacturer can quote on a suitable return system. The systems are designed to supply make up water to the boiler, as well as to return the condensation. Their performance is entirely automatic and the cost of operation is extremely low.

Where a condensation system is not used, the problem of automatic water feed to the boiler still exists. This can be overcome by use of a float type water control, or by an automatic electric pumping outfit. The float type control will operate satisfactorily only when the city water pressure exceeds the boiler steam pressure by about ten pounds or more. The electric units are very reasonable in price and will keep the boiler supplied with make-up water within the 100 pounds of steam pressure allowable in this type of boiler. These pumps are also automatic in operation and require no attention.

### Steam for Heating

As the ordinary cleaning and pressing establishment has a dry room, it is customary for the pressing machine boiler to furnish steam heat to this room. One boiler horse power should be estimated to each one hundred square feet of ordinary radiation in the dry room. If bare pipe is used for radiation, the following figures may be used to determine horse power requirements. One boiler horse power will supply 200 lineal feet of 1 inch pipe, 140 lineal feet of 1½ inch pipe, or 110 lineal feet of 2 inch pipe. Direct condensation returns to the boiler from the radiator can be made if the radiator is placed high enough to accomplish it. For this purpose they are ordinarily hung on the side walls of the dry room at sufficient height to permit gravity flow to the boiler. Of course where a condensation return system is used the floor type of radiator would suffice, the returns being made to the condensation receiving tank by means of ordinary traps.

The matter of flue connection for the gas fired boiler must be considered, and determined pretty much on good judgment. A poor flue connection is worse than none at all. Where a gas fired boiler is located in a large and well ventilated room, no flue connection is necessary from the safety or operation standpoint, but one must not forget that a very considerable amount of heat would be released in the room, which may be unwelcome. If the room is small and poorly ventilated a flue connection must be installed. It should be set up so that a good draft is obtained. It should be short, with a few turns, and with a minimum of horizontal runs. The entire object of the flue is precautionary as the boiler does not require any artificial draft for operation. However, be the room large or small, it is the better plan, and certainly safer, to have a well set up flue connection for the boiler.

A back draft diverter is commonly furnished with the boiler for installation between the boiler flue cap and the flue pipe. It should be used for two important reasons, namely, to break the chimney draft which the boiler does not need and to prevent any possible down draft from smothering the flames.

Where boilers are set on a factory floor of wooden construction it is advisable to insulate the floor from the boiler. Alternate layers of sheet metal and asbestos are commonly used but this type is not as safe as hollow tile. By far the preferred safety base consists of two courses of three inch tile. Also the boiler should be placed at least 30 inches away from wooden walls or partitions. If this is impossible, the walls should be protected with a metal sheathing.

### Safety Features

By means of automatic controls and automatic safety devices the present day gas fired high pressure boiler is fairly fool proof. The snap action low water gas cut off is probably the most recent safety development, but the writer is already conscious of a number of gas fired boilers being burned beyond repair because the boiler was fired when dry, and the low water gas cut off had not even been set. Therefore in installing a gas fired boiler it is most advisable to fire it, and see that all the controls are operating properly, before turning it over to the owner. It hardly seems reasonable that this last step is so frequently omitted.

## Why Sell Appliances—and How?

I have often wondered as to the advisability of drawing an emphatic distinction between purchasing materials and supplies for the operation of utilities and buying merchandise for resale. A utility which engages in the practice of retailing service consuming appliances does so for one or two reasons, namely, to increase the use of its service by the customer and to retail its merchandise thus sold at a profit. It may only consider the first reason as primary and the other as incidental to it. Whatever the reason, there is no desire to lose money in the activity and every incentive to sell at a profit.

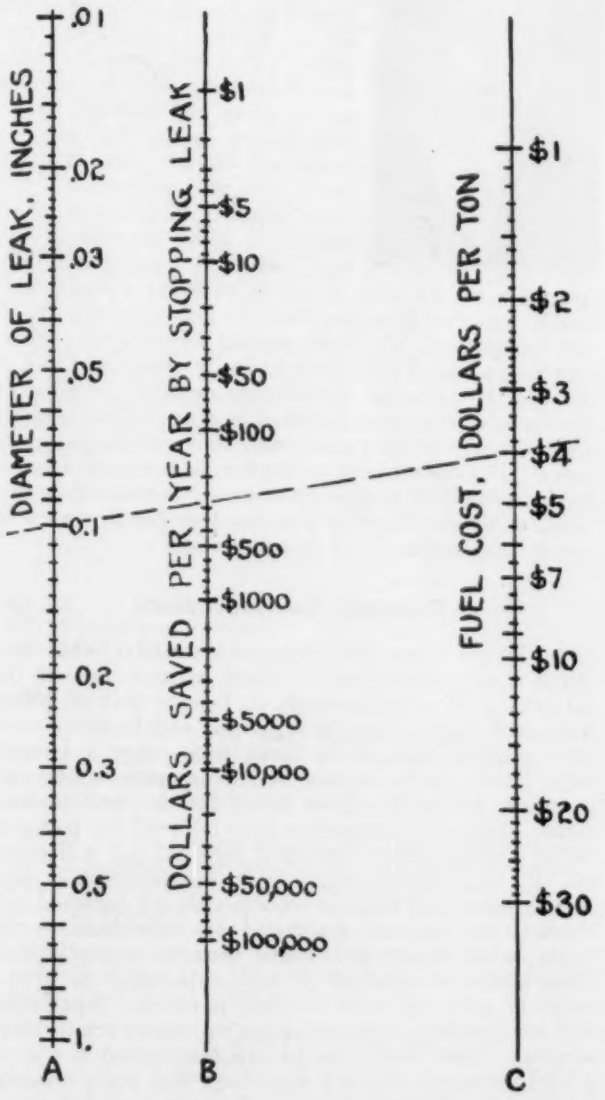
Closely allied with the thought of selling for profit, or, conversely not selling at a loss, is the item of merchandise buying, a profession quite distinct and apart from what many of us know as purchasing. On the one hand, one requires a consummate knowledge and skill in retailing merchandise, and on the other, a distinct and different understanding of engineering requirements and values. Advantageous buying of merchandise for resale suggests also that that function does not exist simultaneously with any merchandising program which depends for its success upon the utilization of the services of the field representatives employed by the manufacturer.

Skilled merchandise salesmen are just as available to gas utilities as to manufacturers who sell merchandise to the utilities. Just why more gas companies do not, or will not, employ the same skill in their own forces has often been a matter of conjecture. In general, manufacturers of appliances do not engage mediocrity; neither should the utilities. The utilities, however, can never expect to obtain anything except the mediocre as long as they adhere to a policy which dictates niggardly pittances for those whom they employ to retail their appliances. My whole thought in this connection may be epitomized in the general statement that gas companies are just as able to hire the services of trained and skilled salesmen as are the manufacturers of equipment, or for that matter, successful merchants in other lines.—*Louis Stein, presidential address before Mid-West Gas Association.*

## The High Cost of Leaking Steam

The dotted line drawn slantwise across this chart tells us that if the diameter of a steam leak is 0.1 inch, and if the fuel costs $4.00 per ton, the annual cost of the leak is about $280. per year.

Estimate the size of your leak and find the corresponding figure in Column A. From that point run a straight line over to the cost of fuel per ton, Column C, and the intersection of the line with Column B gives the annual cost of the leak. Nothing could be simpler, The chart is based on average conditions.




It is interesting to note that a loss as high as $100,000 per year is possible through a 1-inch pipe provided the cost of fuel is as high as I must pay for my house-heating anthracite—$14. per ton. Fortunately, fuel for industrial purposes costs considerably less than $14. per ton in most portions of the United States, and of course leaks are seldom as large as one inch in diameter.

However, regardless of the cost of fuel, and regardless of the size of the leak, this chart makes it perfectly clear that it ALWAYS PAYS to stop a steam leak. Steam leaks are surprisingly expensive.—*W. F. Schaphorst.*

# Customer Communications

**By H. T. East**

*Assistant to Vice-President, Public Service Company of Northern Illinois*

EVERY feature of the gas business which comes to the customer's attention plays a part in molding his opinion of, or attitude toward the company. Personal contacts which customers have with the company at its offices and through its representatives in the field are very important but all contacts cannot be of this personal nature. Contacts of other kinds must be employed in many situations. Any well conceived good-will building program should give attention to every contact which might conceivably be improved to aid in gaining the desired objective. Yet these contact media are so numerous that some of them may be easily overlooked and not receive the attention which they deserve. Among the customer contacts which cannot be classed as personal are the written or printed communications and telephone contacts. The opportunity of improving customer relations by bettering the quality of customer communications is so often overlooked that it seems desirable to review the possibilities which lie in this direction.

### Customer Correspondence

All letters from the company, no matter what their purpose or subject or by whom written fall in this category. It is easy enough to believe that all letters addressed to the company's patrons satisfactorily serve their purpose and at the same time carry a friendly note, but a careful review of correspondence files will in nearly every case show room for decided improvement. Many gas companies have adopted the policy of never writing a letter where a personal call will serve, but written communications require letters and in some cases a letter will serve even better than a personal call. Such letters are often dictated by individuals in the department concerned. These persons naturally hold their positions because of their experience in or familiarity with the work of their particular department and not because of their training or experience in letter writing. Their ability as correspondents may not be of a high standard. Once it is realized that every message which goes to customers on the company letterhead can be made a medium for communicating something besides the information which prompts its preparation, the importance of more careful training of dictators of correspondence and supervision of this important customer contact medium will be appreciated.

Such departments as the operating, engineering, collection, and accounting quite often center their attention upon the subject matter without giving enough consideration to the possibility of conveying a friendly feeling to the addressee. Discourtesy will seldom be encountered in correspondence files and with few exceptions it will be found that the phraseology or tone which may be criticized was unintentional. Among the common errors are positive statements, threats or implications, and curtness. Customers' letters are often poorly constructed in that they lack continuity, directness, and brevity. Because gas companies serve all manners of people, it is highly desirable that correspondence be brief and plain, avoiding long sentences, weighty phrases, and big words. Many gas men reading these remarks will feel that it is mere repetition of well understood facts, but checks made in the correspondence files of representative gas companies show that even the simplest fundamentals of good letter writing are frequently violated. It is the writer's intention to direct attention to the need of supervision and improvement rather than to prepare a treatise on correspondence.

Once the need for improvement is admitted the question of how it may be effected will naturally arise. This can only be accomplished by training those entrusted with dictating letters addressed to customers. Some companies have found that this work requires a special aptitude which is not always found in the departmental employes or their supervisors. Since it appeared to be too great a task to develop able correspondents in all departments the duty has in many instances been delegated to one or more individuals in the organization who have demonstrated their talent for such work. These men either prepare letters for all

Chicago, Illinois,
October 20, 1929.

Mr. A. B. Keyes,
412 Pine Street,
Joliet, Illinois.

Dear Sir:

I am glad to welcome you as one of our new customers and thank you for your patronage.

The intention of our entire organization is to serve you courteously and well. If at any time you do not receive the satisfactory service to which you are entitled, I will consider it a favor if you inform me so that I may give your wishes my personal attention.

Very truly yours,

R K. Curtis

District Manager.

RKC-c.

*Example of "Welcome" Letter*

departments or review all letters before they are mailed. Another plan used is to have all dictation handled by the correspondence department which sees that the information or data submitted by the various departments is incorporated in a letter containing the other essentials before it is sent out. In lieu of using neither of these plans, copies of all letters written may be sent to an individual or department whose duty it is to review them and point out mistakes and opportunities for improvement to dictators. Under this plan the quality of correspondence will gradually improve. The need for a more careful check on outgoing mail and steps for improving company correspondence certainly exists and any action taken along this line will pay big dividends in the form of good-will.

Chicago, Illinois,
October 20, 1929.

Mr. O. S. Darnell,
526 Washington Avenue,
Waukegan, Illinois.

Dear Sir:

In accordance with your request service at the above address is being discontinued. We regret that you are no longer to be one of our family of customers.

It has been a pleasure for us to serve you and our best wishes go with you to your new location.

Sincerely,

R. K. Curtis

District Manager.

RKC-c.

*Example of "Farewell" Letter*

All letters sent out by gas companies are not in answer to communications from the customers. Courtesy letters have been used with great success by gas companies. Such letters are being used to welcome new customers, to thank customers for merchandise purchased, and bid goodbye to customers when they go off service.

Welcome letters may be addressed new customers immediately after they are connected. Care should be taken to avoid sending them to old customers who have merely moved to another location. They should be brief, carefully prepared in simple language and convey a friendly and unaffected message. Some companies insist that welcome letters carry the signature of an officer of the company but under some types of company organization the district manager or other individual in charge of a particular division is the logical one to sign them. Stamped signatures ought never be used. Well worded welcome letters create a favorable reaction toward companies which have used this means of communicating to the customer the company's interest in his patronage and welfare. They add a human touch to a business relationship and no small part of their effectiveness is due to the fact that they are unexpected.

Thank you letters are not in general use and their field is somewhat restricted. They convey the company's appreciation to purchasers of appliances or for payments received for such sales. This deviation from the usual business procedure favorably impresses the patron by giving special recognition to the individual. Care must be taken to avoid introducing sales appeals or other thoughts which might discount the real purpose of thank you letters because their value as good-will letters is destroyed if the recipient gets the idea that the letter has some selfish motive. Other opportunities to use courtesy letters are apologies for interruptions or periods of poor service. Invitations to visit plants or offices may also be classified as good-will building correspondence since they have a decided effect upon the attitude of the recipient even when the invitation they carry is not accepted.

Farewell letters are those addressed to customers who have discontinued service. They carry words of appreciation for the customer's patronage, express regret at the severance of business relations, and wish the customer success and happiness in his new home. The hope that the company may later have the opportunity of serving the addressee is sometimes added. Receipt of a farewell message from a corporation impresses the customer with the thought that the gas company did value his patronage and has gone to unusual ends to tell him so. The value of such communications in the social world is too well recognized and established to permit any doubt of their value in the business world.

Chicago, Illinois,
October 20, 1929.

Mr. J. L. Paulson,
631 Patterson Avenue,
Kankakee, Illinois.

Dear Sir:

You have been kind enough to favor us with the purchase of a gas water heater. We thank you for this purchase and trust it is giving you complete satisfaction.

Our purpose in selling merchandise is to insure your obtaining appliances which will enable you to make the best possible use of our service. We do not consider a sale complete until you are satisfied. Advice or assistance regarding the use or operation of the appliance will be promptly furnished when requested.

Very truly yours,

R. K. Curtis

District Manager.

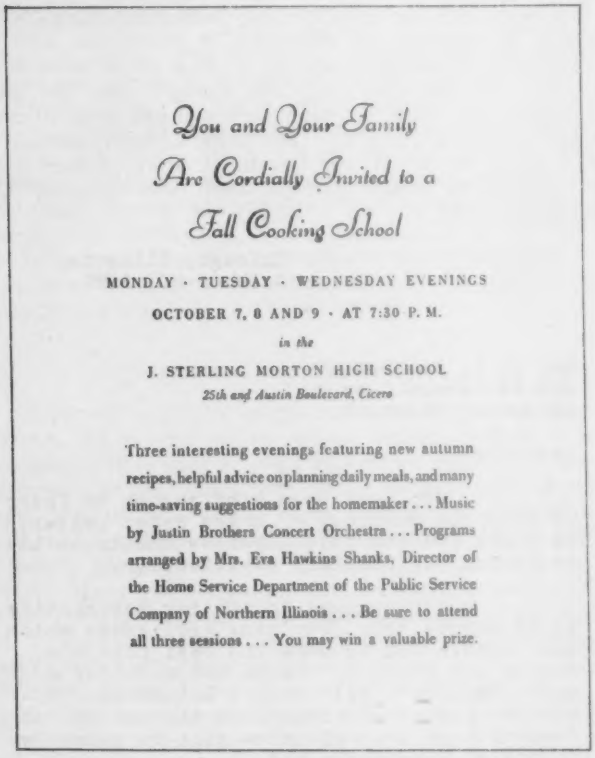
*Example of "Thank-You" Letter*

Monthly Statements are sometimes employed as a medium for carrying messages of various kinds to customers. The range of information so communicated varies widely. Illustrations of this practice are warnings against permitting unidentified company representatives to enter premises, instructions as how to read meters, announcements of store openings, changes in rates, new policies, or service messages designed to

promote public relations. Such messages are oftentimes alternated with advertisements. Although the bill is without question a splendid medium for reaching customers there is a growing tendency to consider the bill as having a definite purpose and a belief that customers should not have advertising or other information forced upon them in this way.

For similar reasons many gas companies frown upon the practice of inclosing printed matter with bills. If not restricted so much advertising material and customer communications will find its way into the bill envelope that the bill itself may be lost. It has been demonstrated that many customers object to having printed matter inclosed with their bills. Opinion is divided as to the propriety of this practice but without queston care must always be used to avoid overdoing the matter.

Other customer communications which have been widely used with gratifying results are neatly printed notices containing information of value to patrons such as changes in company personnel, location of offices,


You and Your Family
Are Cordially Invited to a
Fall Cooking School

MONDAY · TUESDAY · WEDNESDAY EVENINGS
OCTOBER 7, 8 AND 9 · AT 7:30 P. M.
in the
J. STERLING MORTON HIGH SCHOOL
25th and Austin Boulevard, Cicero

Three interesting evenings featuring new autumn recipes, helpful advice on planning daily meals, and many time-saving suggestions for the homemaker . . . Music by Justin Brothers Concert Orchestra . . . Programs arranged by Mrs. Eva Hawkins Shanks, Director of the Home Service Department of the Public Service Company of Northern Illinois . . . Be sure to attend all three sessions . . . You may win a valuable prize.

*Example of Good-Will building copy. Cover of invitation to attend Cooking School*

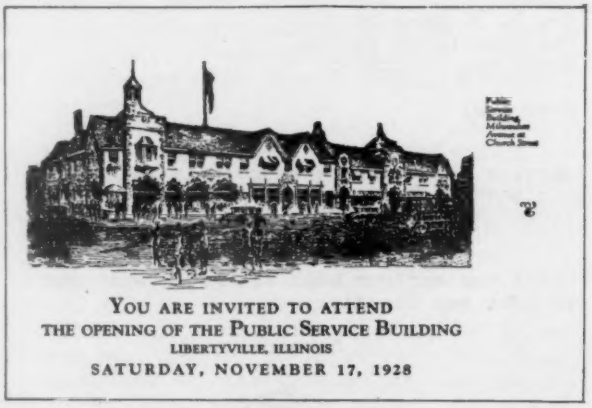
reading dates, or announcement of events, such as cooking schools and demonstrations. Some companies also send out greeting cards during the holiday season. If properly prepared such communications do produce good-will.

### Advertising

There is a growing tendency in the utility industry to devote a portion at least of purchased advertising space to institutional or good-will advertising. Such copy may be alternated with the merchandise ads and will help inform the public relative to the company, its management, and policies. An important move in this direction is to use space to advertise the community or territory served. By doing its part to help build up the city or the territory the company naturally creates good-will in the minds of citizens who have a mutual interest in such progress.

### Telephone Contacts

Much has been written regarding telephone contacts. It is sufficient to point out that since a goodly portion of customer contacts are handled over the telephone too much attention cannot be given the subject. Constant supervision and training is necessary if the telephone contacts are to be of an acceptable quality. Most employes wish to answer the telephone in the proper manner and welcome instructions which will improve their manner or phraseology. Telephone manuals setting forth the better methods and phraseology are very helpful in this direction. Companies which have prepared manuals of this kind report that immediately after their distribution a decided improvement could be noticed in the quality of telephone contacts with patrons.


YOU ARE INVITED TO ATTEND
THE OPENING OF THE PUBLIC SERVICE BUILDING
LIBERTYVILLE, ILLINOIS
SATURDAY, NOVEMBER 17, 1928

*A dignified but friendly invitation to attend opening of new company building*

Communications with customers is a subject concerning which much could be said and written since it has so many angles. The object of this writing is to cite the possibilities which lie in this direction and to urge gas companies to take advantage of them by either adopting new ideas or improving procedures already employed. It cannot be denied that customer communications have an important bearing upon the attitude of customers toward the company and that any productive effort made in this direction will react to the certain benefit of the company concerned.

## Training Gas Company Employees

There are still some companies that train only certain employees; others that train just the office groups, and still others that do little or nothing in the way of employee education or training. In view of the fact that the logical place to seek supervisory timber is among the rank and file of the organization, lack of proper training of the employee deprives the management of an opportunity to capitalize promotions to supervisory positions and forces it to seek candidates for these important places outside of the organization. This is costly, creates dissatisfaction in the ranks, slows up service, lowers production, and, during the long process of educating the newcomer, causes a good deal of unnecessary annoyance to the customer and worry to the management.—*Wm. L. Diehl, 1929 A. G. A. Convention.*

# Low-Temperature Carbonization

## Summary of economic conditions and experimental results reported by British Fuel Research Board

CONSIDERABLE progress has been made during the year in the commercial development of low temperature carbonization. The capacity of the plant installed in this country, and actually producing, has been materially increased, while a number of further plants are under erection. Companies have now been formed with a total nominal capital of over £5,500,000 for the development of some twenty-six different processes, while further capital is being spent with the same object by companies having other objects as well. It is difficult to say definitely what is the capacity of plant in actual operation at any time, but plant with a rated capacity of well over 1,000 tons a day is in existence in this country, while further plant with a nominal capacity of over 6,000 tons a day is stated to be in course of erection. These figures indicate that widespread interest is being taken in both technical and financial circles and that very substantial progress is being made.

The processes being developed include both externally and internally heated retorts, with and without arrangements for stirring the coal during carbonization. The different types of plant all have their own characteristics, and the selection of a plant for any particular set of conditions must take these into consideration.

### Too Early to Predict Success

It is still too early to say whether low temperature carbonization of coal will eventually prove an economic success on a really large scale or to say which of the various processes are most likely to prove successful. Some of the processes are, at the present time, doubtless working at a profit, but it does not necessarily follow that they could do so if the scale of working were greatly increased, or if the same process were applied to other coals, or under different conditions. The following remarks will indicate some of the points that must be taken into consideration in attempting to estimate the success of large scale operation, and will show why it is impossible to say that any low temperature process, as such, is a commercial success except in terms of the particular local circumstances of its operation.

In any system of carbonization a certain proportion of the heat value of the coal is necessarily lost during the process. This loss, together with the operating costs, must be compensated for by the higher value of the products. The products are coke, tar, gas and ammoniacal liquor. The calorific value per lb. of the coke is roughly the same as that of the coal from which it was made, consequently when valued on a thermal basis it will fetch only the same price as an equal weight of the raw coal. It follows that, when the raw coal is suitable for the purpose for which the coke is to be used, the loss in weight of solid fuel and the cost of operating the process, including the cost of heating the retorts, must be met entirely by the receipts from the gas and tar. Where the coke is to be used for a purpose for which the original coal is not suited, e.g., when a cheap slack is being converted into a lump coke suitable for domestic purposes, the price obtained for the coke may cover the cost of the coal used, and even leave a margin towards the cost of working. The price obtainable for the gas will depend on the quality of the gas and the purpose for which it is to be used. The highest price, if the process produces a gas of suitable quality, is obtainable where the gas can be disposed of as town's gas, i.e. to a gas undertaking. Where this is not possible, the gas can be used for any heating purposes required in the neighborhood of the plant, and in this case the price obtainable depends solely on the cost of alternative methods of providing the heat required. This may even be lower than the cost of an equivalent amount of the coal used for treatment when compared on a thermal basis.

### Determining Factors

Every individual undertaking must be considered on its merits, with due regard, on the one hand, to the nature of the coal it is proposed to treat, and the available supply, and, on the other, to the outlets for the coke, tar and gas. On these factors will depend the type of plant, and the site for the plant, that is most likely to be capable of working at a profit. The working costs of a plant include labor power, supervision, maintenance, depreciation and interest on capital. A fairly correct estimate of most of these items can be made by competent men with a knowledge of the local conditions and of the working of any plant that has been operating on a commercial scale for a comparatively short period. The question of maintenance and depreciation, however, is a difficult one, and the life of the retorts will have an important bearing on the ultimate balance sheet. The life can only be ascertained with certainty by working the retorts until they require renewal, and unless the life is short and replacement expenses heavy, this must take a considerable time.

### Rule Does Not Always Obtain

It will be seen from the above that it does not follow that a plant which is successful in one environment will be necessarily successful if operated elsewhere on a different coal, or vice versa. Neither does it follow that an extension of an existing successful plant will necessarily also be a success. The cheaper grades of coal are only cheap because they are essentially a by-product resulting from the production of the higher-priced grades, and in most cases they do not bear their full share of the mining costs, in consequence the availability depends on the demand for the higher-priced grades. In so far as manufactured coke can compete financially with high-priced coal it will affect the demand for the latter, and hence the supply of cheap coal for coke manufacture. The scale on which low tem-

perature carbonization is carried out at present is insufficient for this effect to show itself to any appreciable extent, but should any considerable proportion of the 40 million tons of raw coal at present burned annually for domestic purposes be replaced by smokeless fuel, the demand for household coal will be correspondingly reduced, and the resulting loss to the mining industry cannot be made good if coal for carbonizing is sold at the price now ruling for slack coal.

### Tar-Oil Price Uncertain

The price obtainable for the tar-oil is still uncertain. Up to the present there has been little difficulty in disposing of the limited amounts produced, and prices of the order of 6*d*. or more per gallon have been obtained, but this has probably been mostly used for purposes other than fuel. The spirit scrubbed from the gas, and the lighter fractions of the tar, yield when refined an excellent motor spirit, but only to the extent of 2 or 3 gallons per ton of coal treated. The remainder of the tar can be used as a fuel oil, but for this purpose it is inferior to petroleum fuel oil with which it would compete in the market. The cost of petroleum fuel oil at British ports during 1928 averaged about 3*d*. a gallon. The best method of utilizing the tar-oils is still uncertain; it seems possible that the most satisfactory method will be either to "crack" the tar, or to "hydrogenate" it; either method, if a suitable technique can be worked out, will result in the production of motor spirit.

In purely low temperature processes the amount of ammonia formed is so small that the cost of recovery of ammonium sulphate from the liquor exceeds the value of the sulphate, so that the ammoniacal liquor cannot be considered an asset.

The above remarks should not be taken as being pessimistic or discouraging, it seems likely that there are situations where low temperature carbonization of coal can be made to pay. The factors mentioned really govern the ultimate saturation point, and there is room for large developments before this is reached. Really large scale development must in any case, and of necessity, be a gradual process.

### Results of Tests

As has been stated in previous reports, sanction was given in 1924 for the Director of Fuel Research to carry out tests of plants for the low temperature carbonization of coal, with the object of ascertaining the quality and quantity of the yields of coke, tar, gas and ammonia, the throughput of the plant, working temperatures, and generally as much information as can be obtained, from a test of only some days duration, concerning the ease of running and technical performance of the plant. No charge is made for these tests, but the actual running of the plant is in the hands of the owners, who provide the necessary supervision and labor as well as the coal and any power, etc., required. The Fuel Research staff observes and takes measurements, but does not interfere with the working of the plant. Before such a test is undertaken the Director of Fuel Research must be satisfied that the plant is sufficiently developed to warrant a test, and is of such a size that the technical results can be translated into those to be obtained from a commercial plant.

Six reports on tests carried out under this scheme have been published, including one, during the year under review, on the Maclaurin plant working at the Dalmarnock Gas Works of the Glasgow Corporation, which was carried out in May 1928. This plant was designed for carbonizing weakly caking coals in lump form; it has been in operation for some three years, and the test fully substantiated the technical claims made.

### Efficient Method of Coal Heating

The unit plant is perhaps better described as a "producer" than as a "retort," and the coal is carbonized by the heat produced by the combustion in the retort of a portion of the coke formed. This forms a very efficient method of heating the coal, but necessarily results in the production of a large volume of gas of low calorific value. The yield of gas per ton of coal as charged in the test (9.5 per cent.) moisture amounted to 30,010 cu. ft., but the calorific value averaged 233 B. T. U. per cu. ft., the thermal yield being 69.9 therms per ton of coal as charged. This may be compared with a yield of some 30 therms with a calorific value of 700 to 1,000 B.T.U. per cu. ft., which is usually obtained with an externally heated "low temperature" retort. The plant was worked during the test in the manner usually adopted at Glasgow, and yielded 10.8 cwt. of coke per ton of coal as charged. This coke is normally screened, and that portion (some 75 per cent. of the whole) which remains on a ¾ in. screen is sold as a domestic fuel under the name of "Kincoal," for which there is a good local demand. Gas such as is produced by this plant is suitable for gas engines and for a number of industrial heating purposes.

### Condition for Commercial Success

Only certain types of coal can be used in this plant, but given a suitable coal the plant is simple to operate, and the maintenance costs should be low, but its commercial success must depend primarily on the existence of a suitable use for the gas.

Applications for tests have been received from the owners of two further types of plants, the "Babcock" plant installed at the Dunston Electricity Works of the Newcastle-on-Tyne Electric Supply Co., Ltd., and described in a paper by R. P. Sloan, read before the World Power Conference in London, September, 1928, and the Turner Plant installed at Coalburn, Lanarkshire.

The Babcock plant is intended to work in conjunction with steam boilers, the tar-oils being recovered and the coke and gas burned under the boilers. Arrangements for carrying out the test are in hand, but certain alterations are necessary to ensure accurate measurement of the products, and the owners are desirous of making other alterations at the same time which they think will improve the working of the plant. The completion of these alterations is awaited before final arrangements are made for the test.

The Turner plant has been described in the technical press, and is of the type where the carbonization is carried out by super-heated steam introduced into the retort. It has certain unique features which are claimed to be advantageous. The test was carried out at the end of March and beginning of April, 1929, and the results are being worked out.

The table herewith summarizes the results obtained by the various tests carried out.

## SUMMARY OF RESULTS OF TESTS OF LOW TEMPERATURE CARBONIZATION PLANTS

| Name of Process: | Parker | Midland Coal Products | | Fusion Rotary | Freeman Multiple | Crozier | Maclaurin | Fuel Research |
|---|---|---|---|---|---|---|---|---|
| Name of Coal: | "Dalton Main." | Kirkby Top Hard | Briquettes as Charged (from Washed Slack). | Welbeck Cannel. | Kirkby Top Hard (Washed Slack). | Hawkhill | Virgin Seam. | "Dalton Main." |
| **Moisture (as charged)...** | 5.1 | — | 14.5 | 1.8 | 13.2 | 11.4 | 9.5 | 3.7 |
| **Proximate Analysis (air-dried coal:)—** ..... | | | | | | | | |
| Moisture ..... | 2.4 | 9.6 | 9.7 | 1.8 | 9.3 | 8.3 | 9.2 | 2.5 |
| Volatile matter *less* moisture ..... | 35.8 | 32.5 | 35.1 | 46.6 | 32.2 | 35.2 | 36.6 | 32.6 |
| Fixed carbon ..... | 57.2 | 52.6 | 49.8 | 36.8 | 51.8 | 45.7 | 51.6 | 58.5 |
| Ash ..... | 4.6 | 5.3 | 5.4 | 14.8 | 6.7 | 10.8 | 2.6 | 6.4 |
| **Caking Index** ..... | 19 | — | — | — | — | 4 | 12 | 16 |
| **Utimate Analysis (dry coal)—** ..... | | | | | | | | |
| Ash ..... | 4.75 | 5.94 | 5.97 | 15.00 | 6.34 | 11.77 | 2.93 | 6.2 |
| Carbon ..... | 80.05 | 77.72 | 77.36 | 70.20 | 75.55 | 71.40 | 79.00 | 80.1 |
| Hydrogen ..... | 4.95 | 4.91 | 4.46 | 6.32 | 4.84 | 4.84 | 5.27 | 5.0 |
| Sulphur ..... | 1.10 | 0.96 | 1.21 | 0.78 | 1.12 | 0.80 | 0.75 | 1.5 |
| Nitrogen ..... | 1.60 | 1.94 | 1.47 | 1.50 | 1.44 | 1.58 | 1.99 | 0.9 |
| Difference (oxygen and errors) ..... | 7.40 | 8.53 | 9.53 | 6.20 | 10.71 | 9.61 | 10.06 | 6.3 |
| **Solid Product—** ..... | | | | | | | | |
| *Cwt. per ton ..... | 14.7 | — | 8.8 | 12.0 | 15.5 | 15.4 | 12.12 | 15.7 |
| Volatile matter, p. ct. (air-dry) ..... | 4.2 | — | 2.0 | 9.7 | 16.9 | 14.6 | 3.9 | 6.1 |
| Breeze through ½-in. sq. mesh, p. ct. ..... | 4.7 | — | 15.0 | 99.6 | 100.0 | 17.4 | 9.6 | 17.2 |
| **Temperature of carbonization, °C.** ..... | 550–850 | — | up to 1,200 | up to 550 | 488 | up to 800 | — | 625 |
| **Tar—** ..... | | | | 51.1 | 21.1 | (16.4) + (2.4) | 17.8 | 17.3 |
| *Yield, gallons per ton .. | 19.1 | — | 24.5 | | | | | |
| Specific gravity ..... | 1.063 | — | 1.076 | — | 1.057 | 1.028 | 1.035 | 1.050 |
| Up to 170° C., p. ct. by weight ..... | 4.7 | — | 1.1 | — | 6.9 | 4.1 | 1.1 | 3.4 |
| 170°–230° C. ..... | 14.9 | — | 3.9 | — | 9.5 | 11.7 | 13.9 | 14.7 |
| 230°–270° C. ..... | 12.9 | — | 4.1 | — | 13.9 | 11.9 | 16.0 | 11.1 |
| 270°–310° C. ..... | 18.1 | — | — | — | — | — | 12.8 | — |
| 270°–330° C. ..... | — | — | — | — | — | 15.7 | — | — |
| 270°–360° C. ..... | — | — | 26.9 | — | 29.8 | — | — | — |
| 270°–345° C. ..... | — | — | — | — | — | — | — | 23.4 |
| 310°–350° C. ..... | — | — | — | — | — | — | 20.3 | — |
| Pitch ..... | 48.4 | — | 63.2 | — | 39.3 | 55.9 | 35.5 | 45.8 |
| Loss ..... | 1.0 | — | 0.8 | — | 0.6 | 0.7 | 0.4 | 1.6 |
| Tar acids, p. ct. by volume ..... | 17.1 | — | 13.4 | — | 24.5 | 14.3 | 38.5 | — |
| *Spirit from gas, gallons per ton ..... | 1.88 | — | — | 3.8 | 0.85 | 0.80 | 1.5 | 1.5 |
| **Gas—** ..... | | | | | | | | |
| Volume of gas, cu. ft. per ton ..... | 5,820* | — | 58,300 | 2,790* | 1,860* | 7,400* | 30,010 | 5,390* |
| Calorific value, B.Th.U. per cu. ft. .. .. .. | 700 | — | 193 | 1,070 | 914 | 323 | 233 | 719 |
| Therms ..... | 40.7* | — | 112.5 | 29.9* | 17.0* | 23.9* | 69.9 | 38.7* |
| $CO_2$ ..... | 4.0 | — | 1.6 | 6.5 | 11.5 | 11.2 | 9.3 | 4.0 |
| $C_nH_m$ ..... | 4.3 | — | — | 13.2 | 5.2 | 2.6 | 1.0 | 3.4 |
| $O_2$ ..... | 1.0 | — | — | 1.0 | 0.8 | 1.1 | — | 1.0 |
| CO ..... | 6.1 | — | 28.1 | 6.4 | 6.3 | 6.8 | 15.3 | 6.6 |
| $H_2$ ..... | 37.2 | — | 16.6 | 17.1 | 11.1 | 12.2 | 28.4 | 31.3 |
| $C_nH_{2n} + _2$ ..... | 39.6 | — | 4.4 | 49.5 | 50.6 | 16.7 | 6.8 | 42.6 |
| $N_2$ ..... | 7.8 | — | 49.3 | 6.3 | 14.5 | 49.4 | 39.2 | 10.6 |
| "n" ..... | 1.23 | — | — | 1.59 | 1.4 (about) | 1.32 | 1.34 | 1.27 .. |

* Calculated to dry coal.

*K. H. Logan, Chief of Electrolysis Section, U. S. Bureau of Standards, with some of the test samples to be used in investigating the causes and extent of pipe corrosion.*
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# The Selection of Protection For Proposed Pipe Lines

***By K. H. Logan,***
Bureau of Standards, Washington, D. C.

WITHIN the last few years the importance of soil action on buried pipes has become more generally recognized and recently progressive operators of gas and oil lines have in several instances attempted to take account of soil characteristics in planning new lines. Whether a proposed line should be protected against soil action is entirely an economic problem. Its solution has been discussed at length by Weidner of the Prairie Pipe Line Company[1], by Bly[2] of the Standard Oil Co. of California, and others. Whatever the method used it must take account of two factors, the corrosiveness of the soil and the extension of the useful life of the pipe by the method of protection to be employed. It is well therefore to consider the status of our knowledge of methods of determining these factors.

If a new line is to parallel an old one the corrosion history of the latter is the best index of what may happen to the new line, but pipe line history records many instances of two or more parallel lines where the newer line gave the shorter service. While the poorer performance may have been because of poorer pipe material there is evidence indicating that the relative positions of the lines and perhaps the mere fact that one was rusted and the other clean are factors in the corrosion problem.

By the proper comparison of soil conditions along a line where the corrosion history is known with soils along a proposed pipe line route it should be possible to foretell the corrosion to be expected on the new line. Unfortunately little is known regarding the elements which make a soil corrosive. In general we may expect corrosion in soils which remain moist for long periods, in soils high in soluble salts, in clay soils which shrink greatly on drying and in soils high in organic matter. Anyone with considerable pipe line experience can pick out in a rough way some localities where corrosion can be expected and others it is improbable but if he is re-

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*Publication Approved by the Director of the Bureau of Standards of the U. S Department of Commerce.*

quested to prove that his decisions are correct he will encounter considerable difficulty. Attempts to determine the corrosiveness of soils by chemical analysis are usually disappointing, probably because the corrosion along a line is determined not only by the chemical elements in the soil adjacent to the pipe but by rainfall, drainage, method of backfilling, the differences in soils at different points along the line and the lines or apparatus to which the line in question is connected.

### Methods for Determining Corrosiveness

In addition to chemical analysis several methods of determining the inherent corrosiveness of the soil have been developed. Dr. Holler[3], at the Bureau of Standards, found a rough relation between the total acid in the soil and the corrosiveness of eastern soils as indicated by the Bureau of Standards soil-corrosion specimens. In the west where soils are quite different three methods are being used. One[4] consists essentially of determining the electrical resistivity of the soil, a second[5] assumes that soil action is proportional to the fate of electrolytic corrosion when a section of pipe is made anodic in a sample of the soil saturated with water. A third method[6] bases soil corrosivity on the voltage required to start the flow of current from an iron or steel electrode in soil and on the resistivity of the soil. This method which was originated by J. F. Putnam has recently been somewhat modified as to method of obtaining results.

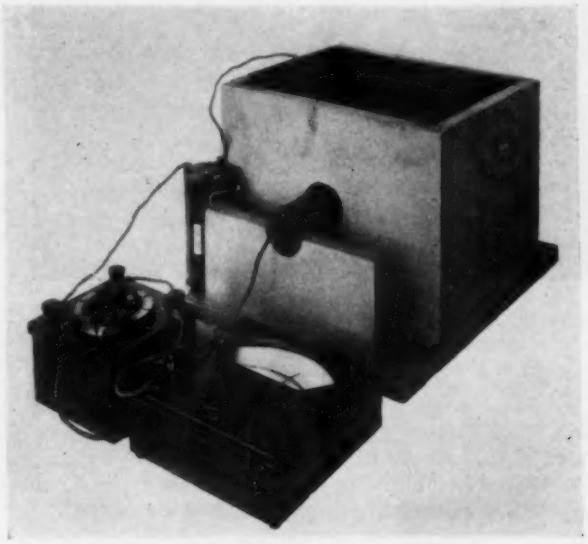
*Removing Specimens from the Field*

Probably there is merit in each of these tests. Extensive comparisons of the methods have not been made and the reliability of all of them is yet to be fully determined.

Assuming for the moment that a pipe owner has determined to his own satisfaction by some method the expected life of the proposed line in each type of soil through which it must pass, he faces the problem of selecting for the seriously corrosive areas some protection which will justify its cost. How long will a proposed protective coating prolong the life of his pipe?

### Research Associates At Work

For more than a year the American Petroleum Institute has had a research associate working under the direction of the Bureau of Standards on this problem. Most of his time has been devoted to the inspection of coatings applied to oil lines. Last December he made a preliminary report[7] on his work. A number of oil men have also reported the results of their experiments. It appears that certain soils tend to destroy many coatings through mechanical action, that some coatings that are satisfactory under certain soil conditions are unsatisfactory elsewhere and that in the past many coatings have failed either through faulty preparation of the pipe to be protected or on account of improper application of the coating material.



*Apparatus for Testing Protective Coatings*

Although many coating salesmen cite numerous instances of remarkable service rendered by their materials there are now available very few data on pipe coatings from which a prospective purchaser can make an intelligent estimate of the life extension which he can expect for his line under his own soil conditions. To get a better idea of the behavior of coatings under typical soil conditions the American Gas Association has recently placed a research associate at the Bureau of Standards to conduct field tests of coatings. With the cooperation of makers of coatings he is now preparing to bury approximately 40 coatings in fourteen carefully selected locations. Within a few years we hope to learn how these coatings behave when properly applied. The American Petroleum Institute is considering somewhat similar tests on working lines.

### The Water Factor

Several laboratory methods of testing protective coatings have been proposed most of which involve in one way or another the absorption of water by the coating. The author has been experimenting with a method[8] in which he places a coated pipe in moist soil and measures the electrical resistance of the coating from time to time. The change in resistance appears in most cases to be caused by absorption of moisture by the coating. F. W. Karl reports satisfactory results from a method in which he forms a galvanic cell by placing a coated pipe in salt water in which a carbon rod is also placed. As moisture penetrates the coating a current flows which can be measured and the time before this current starts as well as the rate of increase indicate the usefulness of the coating.

E. P. Bly[10] has described a method of testing in which the coating is applied to a steel plate on which is placed sand wet with a salt solution. Six volts are impressed between the plate and another electrode in contact with the sand. and the time required for the breakdown of the coating is determined.

*Specimens for Coating Tests*

*Specimens for Soil Corrosion Study*

It will be noted that all of these tests are dependent upon the absorption of moisture by the coating and in one way or another measure this. Dr. Z. C. Loebel presented at the Bureau of Standards soil corrosion conference some data indicating that for certain types of coatings electrical insulating properties are not essential.

### Moisture Tests Not Conclusive

While it may be granted that corrosion will not occur in the absence of all moisture, such a condition is extremely difficult to maintain and the relation between the ability of a coating to exclude moisture and its power to prevent corrosion has not been fully demonstrated. The moisture tests described above are therefore not conclusive. Probably they are satisfactory for certain types of coatings but there is some doubt as to their application to greases and coatings containing inhibitors. On the other hand certain data[11] indicate that pinholes in coatings accelerate corrosion and that a coating containing pinholes may cause a rate of corrosion in excess of that on uncoated pipe.

Our methods of testing coatings are therefore in much the same status as our methods of determining soil corrosiveness. Progress is being made, but the work is only started.

The outlook for the ultimate solution of pipe line protection as an economic problem is good, but at present such a solution is possible only in exceptional cases. Usually it is now impossible to estimate with any satisfactory degree of accuracy either the life of a bare pipe line in new territory or the extension of life to be expectd from a protective coating.

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## Corrosion of Oil Storage Tanks

Valuable information on the subject of oil storage tank corrosion is being obtained by the Petroleum Experiment Station of the United States Bureau of Mines, Department of Commerce, Bartlesville, Oklahoma, and the State of Oklahoma. The great interest manifested by the petroleum industries in the subject of oil tank corrosion is probably due to several causes; first, the development of fields in which high-sulphur petroleum and hydrogen sulphide-bearing gases are being produced, and second, the use of vapor-tight tanks, as corrosion often takes place to such an extent that vapor-tight tanks become leaky.

To carry on this investigation a fully equipped laboratory for making water analyses, photomicrographs, gas analyses, and various sulphur determinations for water, oil, and gas has been established on the lease. In addition to the chemical determinations many observations are continually made on the tank battery itself. Each tank is equipped with ten thermocouples located at various strategic points, the temperatures being determined at regular intervals with a potentiometer. Each tank is also equipped with mercury-actuated recording thermometers. Complete records are maintained of the actual operating conditions in each tank, for example, if the tank is filling with crude oil, standing full, being emptied by the pipe line, or standing empty. Humidity determinations are made on the vapors in each tank. Test strips are suspended in two of the tanks; aluminum strips in one and steel strips in the other. At the end of each 60-day period a test strip is removed from each tank to provide specimens for tensile strength determinations and microscopic studies.

# Mathematical Calculation of the Energy of Flow of Gas, of Injector Action and Gas Speed in Gas Burners

***By Walter Schlechtriem***

Das Gas und Wasserfach, 1929, pages 222-228

**This data is used as a basis for the design and construction of the burner—An example is worked out for a low pressure burner.**

THE following formulae and calculations are not to be considered in the nature of a strictly scientific investigation of the flow of the gas in the gas burner, but rather as a basis of support for the activity of the gas industry in the industrial field.

These calculations are on a development of the author's experience in such work.

A short description of the development of the following technical calculations might be of advantage in substantiating the claim that is made for them, namely, that they are of practical applicability. Complaints from gas users that the gas was bad led the author to institute investigations in many instances to determine the cause, and he found for the most part that the gas burner neither was suited for the purpose for which it was being used, nor was it economical as far as gas consumption was concerned because of defects in its entire design and faulty condition. Some of these burners were constructed by laymen, by concerns, which were concerned with building the special machine which was used for the operation, without however paying any attention to the thermal conditions under which the machine was to be used. Soot-producing burners, burning gas with a luminous flame and ordinary range burners increased in size to meet the requirements for a large gas flame were found in many instances. Too large inlets and outlets for air and combustion gases were also frequently found. Such burners consumed considerable gas in heating up useless volumes of air passing through the burner. This condition prevailed particularly in those cases where a gas burner was used to take the place of coke or coal heating, the burner being built into the furnace.

### Need for Special Burner Data

Although properly designed burners with temperature regulators, ignition devices and safety devices have been available for some time, nevertheless there are numerous cases wherein the regular standard burner cannot be properly used. The cost of developing new burners and apparatus, which are heated by gas, or of making improvements and rebuilding existing installations has been an obstacle in the way of the introduction of gas for industrial purposes and will continue to be so, until the consumer is convinced of the economy of gas. The industrial plant seldom possesses a thermal expert in its organization and it, therefore, remains for the gas company to furnish the necessary technical and economic advice and information regarding the use of gas as industrial fuel. It has been stated above that a special burner for certain purposes is not always manufactured and on the market and it, consequently, behooves the gas engineer, connected with the gas company, to design such a burner or to improve the burner which the industrial manufacturer is now using or in fact to change the entire heating installation.

It is evident that it is essential that the industrial manager and salesman understand the processes that take place in the burner, the gas demand, the gas consumption, the primary and secondary air consumption and to be able to design a suitable burner. If this knowledge is available, then it is possible to judge critically the different features of the burner now in use in the quickest possible manner and to make improvements in it.

### Preliminary Calculations Substantiated

The author has frequently had burners made in the shops of the gas company. Inasmuch as he did not have extensive experience in this field, he had to carry out a series of preliminary calculations based on certain simple assumptions. It was observed with surprise how well the action of the burner corresponded with the preliminary calculations, and the net result was that the users of industrial gas were encouraged and business increased.

(The author mentions at this point that the manufacture of the burners in the shops of the gas company was found to be an easy task.—Trans).

A number of exact, scientific investigations on the flow of gas in the Bunsen burner and on the injector action of burner jets can be found described in the literature. The article by Dr. Pfotenhauer on methods for the design of gas burners in Journal fuer Gasbeleuchtung and Wasserversorgung, 1913, page 486 and on the influence of the mixing tube form and of the heating of the gas-air mixture in the incandescent gas burner on page 1069, and furthermore on the consumption of energy in the gas flow and its use in gas light in Wasser and Gas, 1924, page 148, are particularly worthy of mention.

Theoretical investigations of the afore-described nature may be used in practice for testing the conditions of flow in jets and burners; nevertheless, they do not afford the designer any direct means for the calculation on the controlling factors. Furthermore, the designer usually has not the time to spend in making a complete search of the literature to find information which he can use as a basis for his design. It must also be mentioned that formulae, which requires a certain amount of mathematical skill in their use and which try to express in mathematical form the smallest influences, militate against the introduction of the mathematical process in practical design and this is all the more true, for the reason that numerous designers prefer much rather to start from simplest facts and then later introduce refinements in their design.

According to this tendency, there are devices in prac-

tical use which are suited for a given purpose only in a very approximate manner and in which a better adaptability is secured by regulating the appliance. This is why it is also legitimate to work with approximate formulae in the calculation process. This affords the possibility of introducing simplifications into the mathematical process, of which advantage is taken to a considerable degree in the following. The basic assumption that is made is that the gases, flowing through the burner, possess like temperature and like specific weight. Furthermore, round figures are used in the formulae, which have been derived in part from the literature and are based in part on measurements carried out on appliances. Certain simple formulae of the science of hydraulics can accordingly be used when these limitations are born in mind.

Certain inaccuracies are easily incurred in the calculations, which are incidentally difficult to detect in the formulae. Thus, for example, it is essential that the right units are used for the various factors contained in the formulae, such as meters, cubic meters or millimeters water, etc. (These units are converted into units of the English system in the following). This is the reason why the author has deemed it essential to explain in considerable detail the fundamental considerations on which his calculations are based.

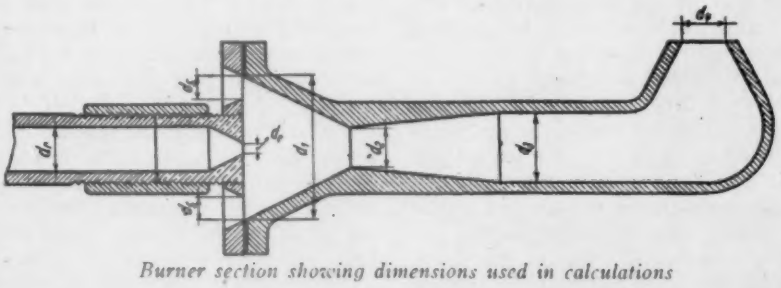
Furthermore, the calculation is carried out almost exclusively on small magnitudes so that errors in the correct location of the decimal point and the like are avoided. Such errors are most easily avoided, when the calculator is afforded an opportunity of comparing his result with a given numerical example and this is the principal reason why such a calculation has been carried out and described in this article. The gas engineer is of course able to test the accuracy of his mathematical results by actual experiments in which measurements are made of the consumption of gas and air and the resulting pressures within the burner by means of meters and other suitable instruments.

### Factors in the Formulae

It is known that the Bunsen burner acts as an injector during the admission of primary air. In order that the reader may get some idea of the variation in the cross-sectional area of the different sections through the burner, the following figure is given and used as a model, although there is no intent to make this a constructive model in all its parts.

The various parts of the burner are designated as below. d is a diameter, measured in millimeters (inches) of the different cross-sections which are assumed to be circular in form, and the various factors d, with their appended sub-indices then denote the following:

With the index r, the inlet tube. With the index o, the mouth of the nozzle of this tube. With the index 1, the entrance of the mixing chamber. With the index 2, the entrance of the diffusing tube. With the index 3, the tube conducting the mixed gas. With the index 4, the burner outlet or jet. With the index 5, the outlet of the air pipe into the mixing chamber. With the index G, gas. With the index L, air. With index M, gas-air mixture.



*Burner section showing dimensions used in calculations*

Other factors in the formulae are as follows. If a unit of surface area of the aforementioned parts with corresponding indices, measured in cubic millimeters (cubic inches); c is the speed of the gas or gas mixture in millimeters per second (in inches per second) in the various parts of the burner, when accompanied by the various indices, described above; w is the pressure available in millimeters of water (inches of water) at the various parts of the burner, designated by the aforementioned indices; $w_n$-$w_m$ represents a drop in pressure in millimeters of water (inches of water) y is the weight of the gas with an index corresponding to the gases being considered and the points shown in the burner; q is the quantity in a second's time in cubic meters (cubic feet) of the gas with the index as indicated above; n is the efficiency of the individual processes.

### Work Consumed in Parts of the Burner Acting as an Injector

The work which is required to bring a gas of volume Q up to p atmospheres pressure and which is set free when the pressure is again released in a jet, is generally expressed by means of the equation: $A = 10000.Q.p_m$ kgms (or in pounds; multiplied by 2.2). The factor, 10000, is inserted into this formula to correspond to the surface of 10000 square centimeters (1500 square inches) of the cubical space Q in cubic meters (multiply by 35 to obtain cubic feet). The factor $p_m$ is the average pressure obtained from the compression diagram, if the pressure p is to be attained. Under the condition of the small pressure differential which exists here it can be assumed, without introducing any great error into the calculations, that the final pressure p is immediately attained at the beginning of compression. The error in this calculation becomes greater when higher pressures are used. The accuracy amounts to approximately eighty per cent when pressures of 2000 millimeters (78 inches) of water are used, but at lower pressures the accuracy is greater. Such low pressures enter this picture.

The aforedescribed formula is accordingly obtained. Inasmuch as p is expressed in this formula in terms of kilograms per square centimeter (14.7 pounds per square inch), in order to obtain the result in kilograms or pounds and inasmuch as the measurements of the pressure of the gas are carried out for the most part in terms of millimeters or inches of water, it would be more convenient to use the pressure unit, inches of water, in this formula in the place of pounds per square inch. The method of converting kilograms per square centimeter to millimeters of water is given below. As one kilogram (2.2 pounds) is the weight of one liter (0.26 gallon) of water, one liter being equivalent to one cubic decimeter and inasmuch as the magnitude of this cube is 100 millimeters (3.9 inches) and as the surface area is 100 cubic centi-

meters or 6.1 cubic inches, then we have the following: $p = \frac{w}{100.100}$ kilograms per square centimeter (multiply by 14.7 to obtain pounds per square inch). Hence the following expression is obtained for the value of the work A: $A = 10000.Q.\frac{w}{100.100}$ or $A = Q.w.$ kilogram-meters (multiply by 7.23 to obtain pounds) (1)

Q is expressed in cubic meters (multiply by 35.3 to obtain cubic feet) in the above formula and the pressure is designated in millimeters of water, in order to obtain the work in terms of kilogram-meters (multiply by 7.23 to obtain foot-pounds). When the factor q is used to designate the flow per second and it is inserted into this formula as well as other factors which are dependent on the time factor s, that is per second, then the work done will be obtained in terms per second. Is the following discussion, when work or energy is referred to, it is intended to convey the meaning of work done per second.

### Calculation of the Quantity of Primary Air Which Is Entrained by the Injector Action of the Gas Jet

One of the problems which we must give our attention to here is the quantity of air, $q_m$, which is converted into a gas-air mixture $q_m$ and which is entrained by the injector action of the flow of gas of quantity, $q_g$, emerging from the gas inlet to the burner, all figures being based on one second of time. The aforementioned quantity of air is lead through the burner tube to the burner jets under known or approximately known pressure conditions.

Gas-air mixtures coming from different types of Bunsen burners were chemically analyzed to determine the proportion of gas and of air present in them. It is not possible to give here the details of this work, but it was found that the quantity of air entrained in one Bunsen burner was 2.6 times the quantity of inflowing gas, while, in the case of a burner used in a gas range, this quantity was 2.92 the amount of gas entering the burner. It is sufficient for the accuracy of this calculation to determine the efficiency of the injector part of the burner to assume that the quantity of air is three times that of the gas.

The formula, which has been described above, is the only one that can be used at this point in the calculation of the efficiency of that part of the burner which acts as an injector apparatus. This, therefore, means that the energy of the gaseous flow through the section $f_r$, the energy of the gas in the section $f_3$ and at the end of the burner tube are compared with the slowly flowing gaseous mixture. Inasmuch as the speed of the gas in the inlet pipe and in the burner tube is small, it may be provisionally assumed that the head which corresponds to this small speed can be properly neglected in these calculations. Hence, we are here concerned only with the static pressure which is available for conversion into speed.

The question now arises as to the magnitude of the pressure drop available. This magnitude is different each time as one proceeds from section to section of the burner. However, we are concerned in this particular instance with the absolute energy, so that the pressure drop must be compared in each individual case with the atmospheric pressure, $w_a$.

The pressure drop in the section, $f_r$, can, therefore, be represented as $w_r$-$w_a$ and in the section $f_2$, as $w_3$-$w_a$. The quantity of gas, $q_a$, flows per second in the section $f_r$ while in the second section, $f_3$, the quantity of mixture $q_M$. According to the principles established above, the following equation can be written: $q_m = q_g + q_1 = 4 = q_g$. The equation for the energy in the quantity of gas entering and leaving the burner is, therefore, represented by the following: $q_g.\ (w_r\text{-}w_a)n = (q_g + q_1)\ (w_3\text{-}w_a)$ (2). The symbol, n, denotes in this equation the overall efficiency. It may also be mentioned that $w_r$-$w_a$ is equal to 40 millimeters of water pressure or 1.6 inches. $w_3$-$w_a$ is also equal to 22 millimeters of water pressure of 0.08 inch. This excess pressure at the end of the burner tube is easily established by actual measurement. It lies mostly between +1 and +2 millimeters of water (+0.04 to +0.08 inch of water). The value which was inserted into the equation as indicated above was used for the purpose of illustrating the manner of its use.

We are concerned with a burner which has a consumption of gas of 0.36 cubic meter per hour (equivalent to 12.7 cubic foot per hour). We accordingly have the following: $q_g = Q/3600 = 0.0001$ cubic meter per second (or 0.0035 cubic foot per second). According to the above the quantity of gas-air mixture is four times the quantity of gas or $4 \times 0.0001$ equal to 0.0004 cubic meter per second or 0.014 cubic foot per second.

When the aforementioned figures are introduced into the formula and certain simple transformations are made, the following results for the efficiency are obtained: $n = 0.0005 \times 2/0.0001 \times 40 = 0.20$, or twenty per cent.

The efficiency of that portion of the bunsen burner which acts as an injector appears to be quite high when calculated in this manner. Nevertheless, it is well known that all injector apparatus possess efficiencies which are generally greater than ten per cent, when the magnitude of pressure on the pressure side of the injector is quite small.

### Adaption of the Energy or Work Equation to High Pressure Gas and Air Burners

The problems which have been discussed up to this point possess certain importance, when we are concerned with the complete combustion of a gas and air mixture within an enclosed combustion chamber without the addition of secondary air for combustion; the required quantity of primary air being sucked into the burner in quantity sufficient for complete combustion by the flow of high pressure gas. According to the figures given above, the pressure which the high pressure gas must have in order that the injector action of the current of gas in the gas outlet into the burner be sufficient to suck in the required amount of gas, (hence practically seven times the quantity of the gas,) and to bring the same to the burner jets, so that the mixture of gas and air at this point is eight times the volume of the gas admitted to the burner, has been overlooked to a certain degree.

It may be that the overall efficiency, n, is equal to ten per cent and that the pressure, $w_3$, is equal to 10 millimeters of water (or 0.4 inch of water. The assumption is made here that certain resistances prevail

behind the burner jets to the removal of the gases of combustion and that a somewhat greater speed of the gas, brought to this point (that is the burner jets) for combustion purposes, must be attained.

When the afore described formulae are employed and the numerical figures are introduced, as have been used above, the following is obtained: $q_G.(w_r-w_a) = 8\ q_G.(w_s-w_a)$. $w_r-w_a = 8.10/0.1 = 800$ millimeters of water or 32 inches of water.

It is consequently indicated that a gas pressure which is 800 millimeters of water or 32 inches above the atmospheric pressure must be present in the well-constructed high pressure burner. It is, therefore, necessary that the gas works arrange to furnish a pressure of 1000 millimeters of water or 40 inches at the point where the gas is being used, if it is to entrain sufficient air into the burner to burn all the gas.

### Initial Pressure Assumed To Be Zero

The reverse proposition also exists, that is, to produce a mixture capable of undergoing complete combustion by means of the injector action of the compressed air which is used to entrain the gas into the burner. It is assumed that in such an injector apparatus the gas before entering the same possesses a pressure of zero inches of water, that seven times the quantity of air is required for practically complete combustion of the gas, furthermore that the efficiency amounts to ten per cent and that a pressure of ten millimeters of water or 0.4 inch exists in the burner tube in front of the burner jets. When these figures are introduced into the above formulae a pressure, $w_L$, of 127 millimeters of water or 5.1 inches is obtained. Inasmuch as the quantity of air, which is available as the actuating medium in entraining the gas into the burner, is equal to seven times the quantity of the latter, the pressure of the compressed air, as the calculation shows, can be considerably less than that required in the gas when a small amount of the latter is used for entraining a large amount of air into the burner. The work done is the same in both instances. A certain advantage, however, is gained in a practical way when compressed air is employed. The comparatively low pressure required in the compressed air can be easily and economically produced by means of compressors, which are of the type that produce pressure of upwards to 200 millimeters of water or 8 inches. These compressors can operate practically continuously and do not require any attention.

### Conversion of Pressure Into Speed

The outlet speed at the burner jets is controlled by the conversion of potential energy into kinetic energy hence by the transition from a condition of rest under pressure to a condition of motion under lesser pressure. A pressure drop, for example between the section, $f_r$, and the section, $f_o$, is available as potential energy. The pressure differential, $w_r-w_o = w$, exists at this point.

The well-known formula, expressing the law of falling bodies, can be used in this connection, in which h is the height and c the speed, thus: $c = \sqrt{2.g.h}$

All the quantities are expressed in terms of meters in this formula. In the case of liquids, h is the height of the level of liquid above the outlet. Atmospheric pressure acts on the surface of the liquid as well as on the outlet, so that in the simplest case the height, h, or the drop of mass is transformed into speed. In the case of gases the height, h, can be assumed to be that of a gas prism on a certain surface area, the latter measured in the same units. Inasmuch as the pressure heads are mostly measured in millimeters of water because of the existing small gas pressures, it is necessary to convert the height of liquid or head of liquid into this unit.

### Further Amplification of the Formula

If G is the pressure, F the surface area of two prisms in square meters, furthermore, h the height of the prism in meters and, y the weight per cubic meter, then, w is the height of a water prism in millimeters of water, and when it is established in addition that the weight of the water prism must be measured in kilograms per cubic meter, that is 1000 kilograms per cubic meter or 62.7 pounds per cubic foot, then the following relation is obtained, when the weights of the two prisms are required to be equal: $G = F.h.y_G = F.w/1000.1000$. The following relation is then derived: $h.y_G = w.$ or $h = w/y_G.m$. When this expression is introduced into the general formula for falling bodies, then it becomes as follows: $c = \sqrt{2g.w/y_G}$ (3). Due to the frictional resistance, contraction, etc., it is necessary to introduce a certain coefficient, k, into this formula before it can be used for practical purposes. The formula then becomes: $c = k\sqrt{\frac{2g.w.}{y_G}}$

In this particular form, the formula is best adapted for the calculation of the speed of flow of gas at low pressures.

*(To be concluded in January, 1930 issue)*

## Industry Concerned With Less Than One-third of Accidents

Industry is concerned with less than one-third of all the accidents that occur. The safety standard set by industry is far higher than the safety standard which the people as a whole set for themselves.

Industry has shown a consistent and marked improvement in its accident record over the period for which records are available. The large, financially strong, and well managed companies show the best safety records.

While some remote physical accident hazards cannot be eliminated because of the high cost, the great number of accidents are saved by intelligent and persistent attention to the requirements for safety, sponsored by management and maintained by employees. Good management and sound economic conditions invariably bring a good safety record to any industry.

Safety publicity should be based on showing the public how to use products in a safe way rather than on emphasizing the danger of using them the wrong way.

Finally, the conclusion is reached that industry and safety are allies rather than opponents, and jointly dependent on each other. Safety engineers should study the economic problems of industry, and by showing a sympathetic interest in these problems will thereby obtain the maximum cooperation and support from industry, their most powerful ally.—*E. C. Stone.*

# IV. Capacity of Pipes, Meters and Gas Orifices

THE three foregoing articles logically form a single group of topics based on the general commercial features of gas as a domestic fuel. The current and forthcoming installments will be devoted to the general engineering and installation requirements of domestic gas appliances after which the important appliances will be considered individually from their adaptability for the service for which they are used.

The fuel gas, after being stored in a holder, is distributed to the consumer by one of two basic methods. Either the gas is put into the mains at about the same pressure at which it is used or it is sent out at higher pressures and subsequently reduced to usable pressures at central governor stations or on the consumers' premises. In either case, the first point at which gas becomes the exclusive interest of the salesman is at the inlet to the customer's meter. Previous to this the manufacturing and distribution departments carry the gas from the raw fuel through the various steps to the customer's front door. From here they turn over their product to the sales department. A knowledge of the meter and particularly indexing by the salesman often nips high bill complaints and general dissatisfaction in the bud.

## Gas Meters

For domestic purposes only two types of meters are in wide use, the tin case meter and the cast iron meter. The tin case meter was the earliest form and is largely used in manufactured gas properties. With the higher pressures of natural gas distribution (up to 8 oz.) the cast iron meter was developed because of the fear of damage to the tin meters. In addition, meters in these territories were often installed in the open and the heavier casings withstood weather conditions much better. It is present practise to use cast iron meters on high pressure manufactured gas lines and in smaller communities where an elaborate repair shop for tin meters would be a great expense.

Gas Meters were first rated on the basis of the English Standard Burner which consumed six cubic feet per hour under standard conditions (30 inches mercury column and 60°F.). The capacity of a meter was then the number of lights multiplied by six: for example, a 3 Lt. meter passed 18 cu. ft. per hour and a 20 Lt. meter 120 cubic feet. As time went on, improvements were made in the mechanism and the capacities for a given case size increased. Changes which were made in design, but not in principle, also increased the capacities so that the present maximum capacities of the standard domestic sizes can be set down in the following tables.

**TABLE NO. 1**
**Maximum Capacity of Tin Case Meters**

*Based on 4" W. C. Inlet Pressure and .5" Drop*

| Size | Capacity Cu. ft./hr. |
|---|---|
| 3 Lt. not more than | 60 |
| 5 Lt. | 70 |
| 5 Lt. B. | 140 |
| 10 Lt. | 125 |
| 10 Lt. B. | 275 |
| 20 Lt. | 200 |
| 20 Lt. B. | 450 |
| 30 Lt. | 290 |
| 30 Lt. B. | 600 |

**TABLE NO. 2**
**Maximum Capacity of Cast Iron Meters**

*Cubic Feet per Hr.*

| Size | 2" W.C. ½" drop | 5 ounces Press. 1 ounce drop. |
|---|---|---|
| 5 Lt. B. | 150 | 330 |
| 10 Lt. B. | 250 | 430 |
| 20 Lt. B. | 375 | 600 |
| 30 Lt. B. | 600 | 950 |

The gas meter is without question the most reliable measuring instrument made. If the average accuracy of an equal number of gas meters and high grade watches, for example, was determined, over a period of years, both exposed to the same conditions, the gas meters would be found to be many times as accurate.

The few gas meters which become inaccurate, favor the customer by passing more gas than they record or the registration is "slow" in 95% of all checks made. The original accuracy of the meter was compared to standards which are correct within very narrow limits and sealed after widely different rates of gas have been passed through the meter. The simplicity of design of the moving parts makes extremely long service at full accuracy very usual.

## Indexing

The indexing of meters is a definite art gained by experience. To an indexer the correct reading of a set of dials is second nature. The positions of the various pointers indicate at a glance to the experienced man the state of the meter. To a person who is not constantly at the work, reading meter dials is a trifle more difficult. By attention to certain simple rules, however, the index can be taken without error by anyone. Readings can be taken and recorded either from right to left or vice versa, the values taken down being one less than the figure which is being approached. The former method is to be preferred, particularly for the sake of accuracy in the few cases where a doubt can exist about the correctness of the reading. In the domestic meter the lowest reading is in multiples of 100 cubic feet, i.e., each division of the right hand dial represents 100 cubic feet, with a complete revolution equivalent to 1 M. cubic

feet. Figure 1 shows the position of the pointers on the dial of a new meter with a reading of 00.0 M., each of the pointers covering the zero. After one complete revolution of the pointer registering hundreds and marked 1 thousand has been made, the dial face is as shown in Figure 2, the reading being 01.0 M. cubic feet. As all the pointers are geared together, every dial moves in proportion to its value. It will be seen that the 100 Thousand pointer has left its original position and moved toward 1. When the middle pointer has

*Fig. 1. Index on New Meter 00.0 M. Cu. Ft.*

*Fig. 2. Index 01.0 M. Cu. Ft.*

*Fig. 3. Index 10.0 M. Cu. Ft.*

completed one revolution the registration is 10.0 M. cubic feet and the face appears as in Figure 3. With the proper attention to the few fundamentals, no difficulty should ever be encountered in 98% of all cases. There may, however, be a few instances as shown in Figures 4, 5 and 6, which may give trouble to the unwary. A little study will give the correct registration of 09.9 M. cubic feet for No. 4, 10.9 M. cubic feet for No. 5, and 90.9 M. cubic feet for No. 6. The dial settings of Figs. 4 and 5 are very similar and at first glance innumerable errors will occur.

Varying systems are used by different companies to guarantee correctness of reading before submitting bills to customers. Among these are the checks made by the bookkeepers of the Customers Accounting Department. Some companies arbitrarily set a maximum consumption for each size meter which must not be exceeded over any normal indexing period, others automatically refer an abnormal (great or small) reading back to the

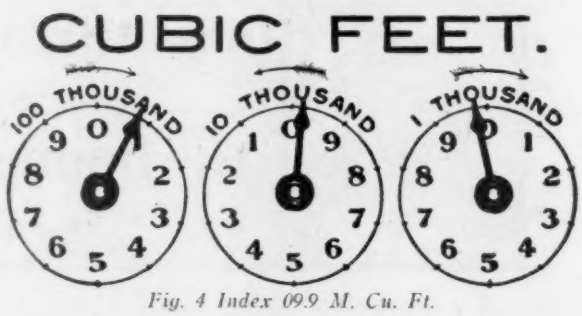



*Fig. 4 Index 09.9 M. Cu. Ft.*

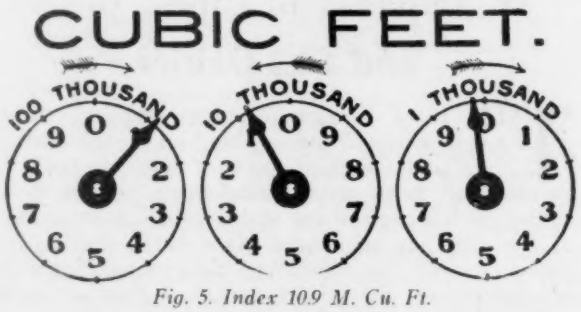



*Fig. 5. Index 10.9 M. Cu. Ft.*

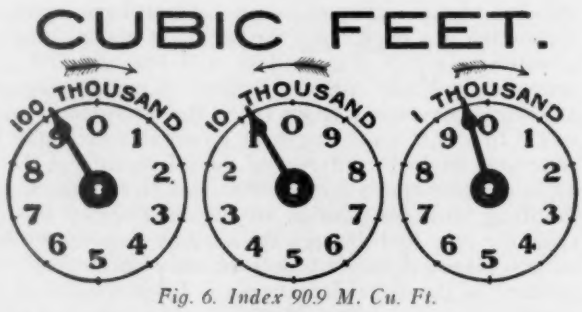



*Fig. 6. Index 90.9 M. Cu. Ft.*

indexer for confirmation. In this way bills are invariably free from errors when received by customers.

### House Piping

There must always be piping between the meter and appliance, but in almost all cases the user is unaware of this piping. This is always true if the piping is installed of sufficient capacity and free from traps or obstructions. Table No. 3 from the A. G. A. Industrial Gas Handbook Series, lists the maximum capacities of usual sizes of house piping used as laterals with a pressure drop of .2 inches water column over the lengths given in the left hand column. A similar tabulation from the same source for the capacities of risers makes up Table No. 4. Computers are also available for determining the capacity of all sizes of piping for different lengths and for pressure drops other than those on which the above Tables are based.

Poor gas service can result, however, even if the pipe capacities are sufficient, if the installation of this piping is improper. There are many improper ways for connecting piping, but each gives a definite result on the flame. After watching the flame for a short time, the cause for poor service can be definitely assigned and traced out. The three most common piping difficulties consist of two different kinds of traps and an obstruction. Often piping was offset around beams and projections using elbows instead of carrying the lines straight. In carrying pipe down and up traps were cre-

**TABLE NO. 3**

**Showing Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. per Hour with Pressure Drop of 0.2 Inches and Specific Gravity 0.6.**

*To be used for figuring Laterals and Service Pipes*

| Length of Pipe Ft. | Diameter of Pipe, In. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ¾ | 1 | 1¼ | 1½ | 2 | 3 | 4 | 6 | 8 |
| 15 | 168 | 350 | 620 | 960 | 2000 | 5400 | 11,200 | 31,000 | 63,000 |
| 30 | 120 | 245 | 430 | 680 | 1400 | 3800 | 7,900 | 21,500 | 44,000 |
| 45 | 98 | 200 | 355 | 530 | 1150 | 3200 | 6,500 | 18,000 | 36,500 |
| 60 | 84 | 175 | 310 | 480 | 1000 | 2700 | 5,600 | 15,500 | 31,500 |
| 75 | 76 | 155 | 275 | 430 | 890 | 2450 | 5,000 | 13,700 | 28,000 |
| 90 | 70 | 145 | 250 | 395 | 810 | 2260 | 4,550 | 12,500 | 26,000 |
| 105 | 64 | 132 | 232 | 370 | 750 | 2100 | 4,200 | 11,500 | 24,000 |
| 120 | 60 | 125 | 215 | 340 | 700 | 1950 | 4,000 | 11,000 | 22,000 |
| 150 | 54 | 110 | 195 | 310 | 630 | 1750 | 3,550 | 9,800 | 20,000 |
| 180 | 49 | 100 | 175 | 280 | 570 | 1600 | 3,200 | 8,900 | 18,000 |
| 210 | 44 | 94 | 165 | 260 | 530 | 1450 | 3,000 | 8,200 | 16,500 |
| 240 | 43 | 88 | 155 | 249 | 500 | 1350 | 2,800 | 7,700 | 16,000 |
| 270 | 40 | 83 | 145 | 230 | 470 | 1300 | 2,650 | 7,100 | 15,000 |
| 300 | 38 | 79 | 138 | 215 | 440 | 1250 | 2,500 | 6,900 | 14,000 |
| 450 | 31 | 64 | 112 | 176 | 360 | 1000 | 2,050 | 5,600 | 11,500 |
| 600 | 27 | 56 | 97 | 152 | 315 | 860 | 1,750 | 4,900 | 10,000 |

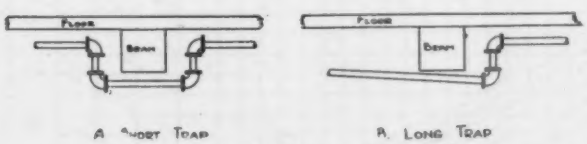
**TABLE NO. 4**

**Showing Capacity of Pipe of Different Diameters and Lengths in Cu. Ft. per Hour with Pressure Drop of 0.5 In. and Specific Gravity 0.6.**

*To be used for Figuring Verticals and Risers*

| Length of Pipe Ft. | Diameter of Pipe, In. | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | ¾ | 1 | 1¼ | 1½ | 2 | 3 | 4 | 5 | 6 | 8 |
| 15 | 270 | 560 | 980 | 1540 | 3200 | 8600 | 17,800 | 31000 | 49000 | 100000 |
| 30 | 190 | 390 | 680 | 1080 | 2200 | 6100 | 12,500 | 22000 | 34500 | 71000 |
| 45 | 155 | 320 | 560 | 890 | 1800 | 5000 | 10,300 | 18000 | 28000 | 58000 |
| 60 | 135 | 280 | 490 | 770 | 1600 | 4300 | 8,900 | 15500 | 24500 | 50000 |
| 75 | 120 | 250 | 430 | 680 | 1400 | 3800 | 8,000 | 14000 | 22000 | 45000 |
| 90 | 110 | 230 | 400 | 620 | 1300 | 3500 | 7,300 | 12500 | 20000 | 41000 |
| 105 | 102 | 210 | 370 | 580 | 1200 | 3300 | 6,800 | 11800 | 18500 | 38000 |
| 120 | 96 | 200 | 345 | 545 | 1100 | 3100 | 6,300 | 11000 | 17400 | 36000 |
| 150 | 87 | 180 | 310 | 490 | 1000 | 2700 | 5,600 | 9800 | 15500 | 32000 |
| 180 | 79 | 160 | 280 | 445 | 900 | 2500 | 5,100 | 8900 | 14000 | 29000 |
| 210 | 73 | 150 | 260 | 410 | 840 | 2300 | 4,800 | 8300 | 13000 | 27000 |
| 240 | 68 | 140 | 245 | 385 | 790 | 2150 | 4,400 | 7700 | 12300 | 25000 |
| 270 | 65 | 130 | 230 | 365 | 740 | 2050 | 4,200 | 7300 | 11500 | 23500 |
| 300 | 61 | 125 | 220 | 345 | 710 | 1950 | 4,000 | 7000 | 11000 | 22500 |
| 450 | 50 | 100 | 180 | 280 | 570 | 1600 | 3,200 | 5600 | 8900 | 18000 |
| 600 | 43 | 88 | 150 | 240 | 490 | 1350 | 2,800 | 4800 | 7600 | 15500 |

ated which after many years accumulated condensate. When enough had collected it formed a liquid seal through which gas must force its way. Modern practise uses a capped tee at the lowest point which can be drained if necessary. The result is seen on the lighted flame, particularly if it is made luminous. The flame constantly fluctuates as gas bubbles through the short trap. The accompanying figures 7A and 7B show the

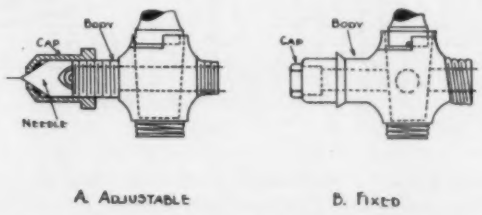



*Figs. 7A and 7B Short and Long Traps*

short trap and long trap. The action of a flame with gas passing a long trap is the reverse of that seen with the short trap. The flame drops suddenly as the gas goes through the liquid condensate and then gradually builds up as the liquid levels in the two legs of the trap equalize. A porous obstruction, such as mill scale, manifests itself by a diminution in the size of the flame as additional burners are lit. By careful observation of such flame action, a salesman or home service worker can usually save the repair departments much time in getting at the seat of the poor gas service.

## Capacity of Gas Orifices

Having passed the meter and through the piping, the gas comes to the appliance, the point of use, with but little loss of pressure. As previously pointed out, air must be mixed with the gas at the burner before combustion can take place. The methods for making this mixture follows the principles originally discovered by Dr. Bunsen. This consists of allowing the gas to expand from a small orifice into a relatively large tube provided with openings to admit air. This mixture of primary air and gas issues from a port and burns with the surrounding layer of secondary air. With but few exceptions all appliances are equipped with Bunsen type burners, even though the design is far removed from the original burner of Dr. Bunsen. The designs have been created to give a greater heated area or localized temperature at one point or to do one of a number of things which are necessary to give a well functioning appliance.




*Figs. 8A and 8B Adjustable and Fixed Orifices*

The orifices from which the gas issues are of two general types; the adjustable orifice and the fixed orifice. As the name indicates, the former is one which has provisions for changing the size and consequently the delivery of the orifice. Its design follows that of Fig. 8A adopted by the A. G. A. as an acceptable design for gas range cocks. It consists of three necessary parts; the body, the needle and the cap or hood. The gas capacity of this type depends on the relative positions of the needle and cap, which change the free area through which gas can issue. The value of the adjustable orifice is the ease with which it can be adapted to different kinds of gas. Good mixtures can be made with gases of widely different heating values and gravities by changing the adjustment until the proper flame results.

## Flow Through Orifices

The fixed orifice is one which has a definite area limiting the gas flowing through it. This orifice is drilled in a spud which screws into another part of the burner, usually the cock. Fig. 8B shows a cock design as recommended by the A. G. A. with a spud and fixed orifice. With a definite area and gas pressure, a maximum gas flow occurs through a fixed orifice. Figures 9A, 9B and 9C prepared by the Technical Editor of the A. G. A. show the gas flow through orifices of different Morse Twist Drill sizes. These curves are based on a gas of 0.4 specific gravity and at pressures of from 2.5 inches W. C. to 10 in. W. C. The chart also gives a direct conversion to gases of any specific gravity. To illustrate the use of these charts find the discharge of a gas of 0.6 sp. gr. from a No. 41 orifice with an initial pressure of 4 inches W. C.

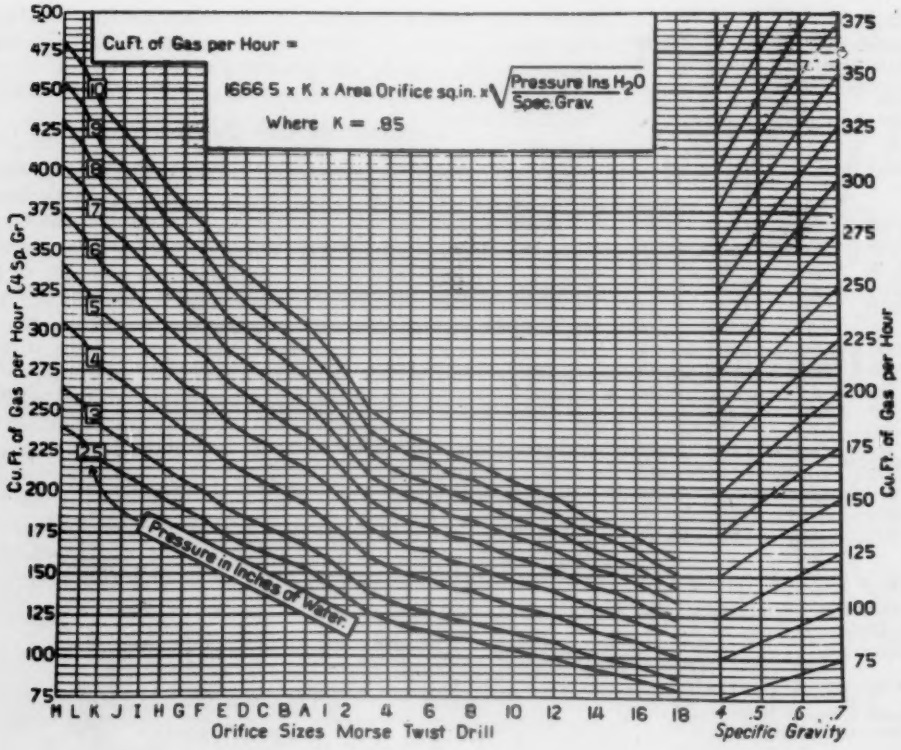

Cu.Ft. of Gas per Hour =
1666.5 x K x Area Orifice sq.in. x √(Pressure Ins. H2O / Spec. Grav.)
Where K = .85
Cu.Ft. of Gas per Hour (4 Sp.Gr.)
Cu.Ft. of Gas per Hour
Pressure in Inches of Water
Orifice Sizes Morse Twist Drill
Specific Gravity

*Fig. 9A Approximate Gas Discharge from Orifices in Cu. Ft. Per Hour. Section 1—Sizes M to 18 M.T.D.*

Using the left hand chart and following the vertical at 41 on the scale "Orifice Sizes Morse Twist Drill," it is found to intersect the wavy curve |4| at A. Follow a horizontal which crosses the left scale "Cu. ft. of Gas Per Hour" (0.4 Sp. Gr.) at B. Therefore the discharge of a gas of 0.4 sp. gr. is 30 cu. ft. at 4" pressure. Follow the same horizontal line from A towards the right until it crosses the vertical line starting at 0.6 specific gravity at C. The discharge is then estimated from the position of this point, according to the right scale "Cu. Ft. of Gas per Hour." This point is about 2/5 of the distance between the 20 and 30 curves or the discharge of 0.6 sp. gr. gas is 24 cu. ft. per hour.

*(The next installment will consider proper appliance installation rules and safeguards.)*

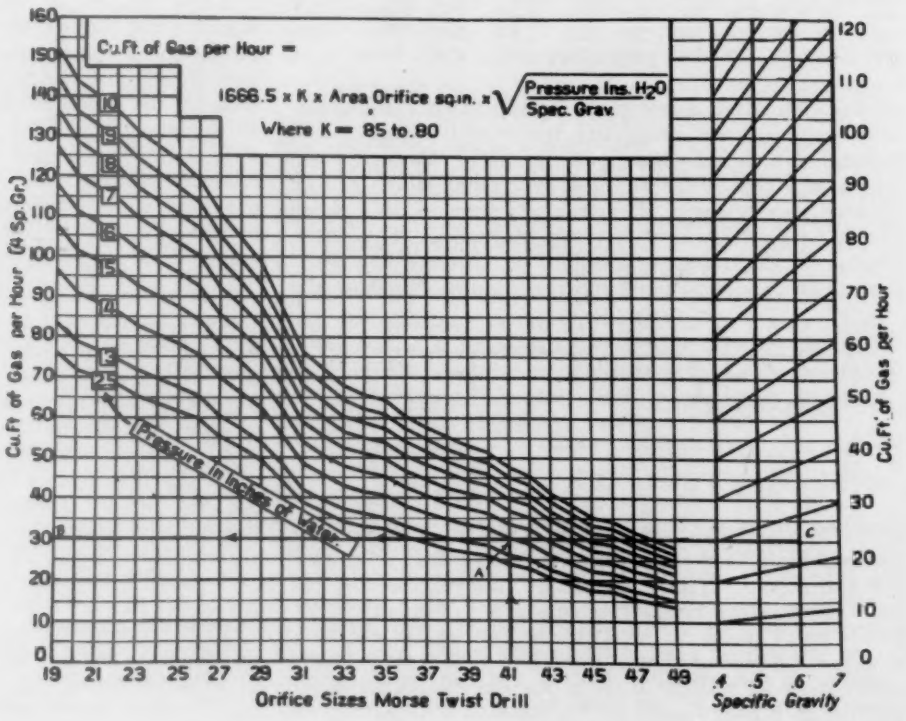

Cu.Ft. of Gas per Hour =
1666.5 x K x Area Orifice sq.in. x √(Pressure Ins. H2O / Spec. Grav.)
Where K = 85 to .80
Cu.Ft. of Gas per Hour (4 Sp.Gr.)
Cu.Ft. of Gas per Hour
Pressure in Inches of Water
Orifice Sizes Morse Twist Drill
Specific Gravity

*Fig. 9B Approximate Gas Discharge from Orifices in Cu. Ft. Per Hour. Section 11—Sizes 19 to 49 M.T.D.*

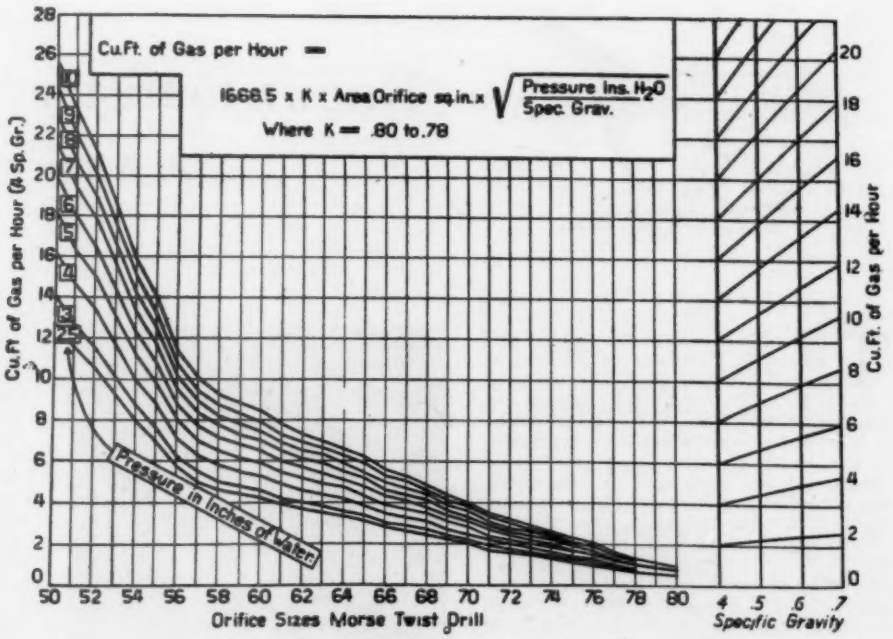

Cu.Ft. of Gas per Hour =
1668.5 x K x Area Orifice sq.in. x √ Pressure ins. H2O / Spec. Grav.
Where K = .80 to .78
Cu.Ft. of Gas per Hour (& Sp. Gr.)
Cu.Ft. of Gas per Hour
Pressure in Inches of Water
Orifice Sizes Morse Twist Drill
Specific Gravity

*Fig. 9C Approximate Gas Discharge from Orifices in Cu. Ft. Per Hour. Section 111—Sizes 50 to 80 M.T.D.*

## Where is the Cooking Now Done?

Regardless of the cause, if there is a specific one, of the stagnation of the growth of the domestic load, food is still being cooked and will continue to be cooked. I hold the view that it is possibly being cooked in other and larger kitchens, and that therefore the transition which has come about as a result of a change in modes of living or as a result of superprosperity, has been a geographical transition. Fuel for the preparation of food in the home kitchens heretofore sold on a retail basis, possibly should now be sold in wholesale quantities to those who make it a business to prepare and sell food for domestic consumption. One might say with some degree of accuracy that the so-called domestic cooking load is transforming itself to an industrial affair. Those who eat are certainly not decreasing in number, even though many of them may be attempting to decrease the visible and weighty evidences of unintelligent eating. The advertising and publicity fraternity should be able to satisfactorily explain why the can opening season is always with us; and the best trained economists and psycho-analysts will have to supply an answer to the question of why the housewife may no longer be interested in the economies available in her own kitchen.—*Louis Stein, presidential address before Mid-West Gas Association.*

## A Foreman Talks on Safety

Here are some thoughts on a very important subject taken from a recent publication of the National Safety Council.

"The foreman has to be Human with his men if he expects to have a good accident record. If a worker is afraid of his boss, he's going to be worried, and if a man is worried he is in poor shape to keep away from an accident, if one comes his way. Another thing I watch is to see if a man is feeling right. If a worker isn't in good health he's liable to get hurt, and it is better to send him to the doctor for a pill or two than to send him later with an injury. If I can see a dangerous machine that I think ought to be guarded I put it up to my superintendent at once to be taken care of. But falls, sprains, infections, hand tools and many other causes of accidents have to be watched for by the foreman all the time, too, because some of our worst cases come from these. Many accidents happen because the shop isn't kept shipshape, but the foreman can keep it neat if he wants to and this not only keeps down accidents such as falls, but makes the stock easier to handle, and easier for the man to get around.

"It has been said the foreman is the key man. I like to think of the foreman as holding a key that will open a door of opportunity to keep people from getting hurt. He can do it, I've proved that: he ought to do it, because his superintendent wants him to and because he is responsible for the way his men work; and lastly, he ought to teach safety simply to help the other fellow."

## Japanning Upholstery Springs

The tempering furnace used in the plant of the Kay Manufacturing Co., Brooklyn, N. Y., is approximately 110 feet long and is of a duplex nature, about twenty feet of its length being used for japanning and baking the springs.

Gas is the only fuel which could be used for such purposes in such a mechanical apparatus, for it is the only fuel which can be properly controlled so that different temperatures can be maintained in different parts of the apparatus. The springs, after tempering, are dipped automatically into a batch of japan at a temperature of 210 degrees F. And then pass to the draining section where the excess japan drips off and where the temperature is about 490 degrees F. The japan is baked at a high temperature with the result that the entire operation of japanning, baking and cooling takes only one hour. The oven is thermostatically controlled.

# Known to History as The Gas Era

**By William H. Matlack**

THE daily mail indicates that the gas appliance manufacturer knows no seasons, in selling.

To-day's mail (August 31), typical of many other days, brings a two-color broadside from the manufacturer of a continous flow gas water heater, that tells of a "Harvest Time" campaign to help swell the water heater sales curve; a letter with proof of an advertisement from another announcing that "hot water is going on the air"; still another announces the publication of a "Buyers Guide" that will aid the gas appliance salesmen in selling "carefree hot water service." (We thought that was a good line when we coined it.)

A manufacturer of radiant gas fires sends a broadside, proof of ready made advertisements and cuts that may be had for the asking. One gas range manufacturer announces, via the most elaborate bound volume you ever saw, two new ranges fit for the palace of a King, which may be purchased by Mrs. Average Homemanager; another adds to the array and selling features of gas ranges by offering a new insulated range with chromium oven and broiler linings; still another features an automatic mainstop, oven and broiler lighter that entirely meet a long desired sales aid. Then follows literature from the manufacturers of two incinerators; a laundry dryer; a gas appliance that enables man to manufacure his own in-door weather, with gas, while there is literature from the manufacturer of a gas refrigerator which tells of the advantage of home ice making and refrigeration of food—a tiny gas flame is laying luxury in the lap of the home manager, serving her better and more completely than ever was the dream of Cleopatra or any other ancient queen.

### Manufacturers Building Them Better

Aside from designing new appliances, moderné in line and color, gas appliance manufacturers are embodying many times labor and food saving devices on these new appliances; building them better, more beautiful and efficient and at a price that in no way prohibits their purchase by the woman who manages her own home and manipulates the family budget.

Aside from designing and manufacturing better, more beautiful and efficient appliances the manufacturers of gas appliances are offering many constructive helps to the dealer in moving his stocks out of his store and into the homes of the ultimate users.

The manufacturer of a continuous flow water heater, for example, has built and offered his dealers not one but several complete, worth-while sales plans during the past nine months. Radiant gas fire manufacturers, manufacturers of laundry

*William H. Matlack*

dryers, incinerators, ranges and refrigerators are all tuning into the times, furnishing dealers with constructive, carefully thought out and planned sales assistance. This assistance is built around the idea, "what it will do for you" and applies to dealers, and users.

New ideas, new products, new processes, new merchandise are all being thrown into the game of bringing happiness, efficiency and more time to the American home manager. The enormous power of a new idea and its ability to captivate customers may be seen in the new uses of color and moderné design in home furnishings and appliances. An idea is a potent thing and as long as gas men are born into the world with ingenuity and ambition ideas will propagate for the use of the progressive, and no matter what those in the dolefuls may say the gas industry will be a going industry.

Aside from that school applying its thoughts to new merchandise and new uses for gas there is another school which is concerning itself with devising ways and means of placing the industry on a modern business basis. This school is concerning itself with fair rates of return from those it serves thinking in terms that look to the devising of rate structures that will be in tune with the times. The growth of many companies, it is said, has been materially retarded by inequitable, antiquated rate sructures. Many companies operating on rates that were devised at a time when the industry was engaged, primarily, in the manufacture and distribution of gas for lighting purposes, find that as many as one-third of their present customers are being served at a loss. Further, it has been found that another large percentage of the remaining are just paying their way and nothing more in the way of a return, while the minority, aggregating the larger customers, are not only paying their own way and a fair return to the company but are also making good the deficits of the majority.

With such a condition existing, "it is obvious," say the merchandising minded, "that if the sale of the newer, or let us say the least exploited, appliances, to all home managers is to be accomplished a new 'part rate' structure will have to be devised." "In building this type of rate, assuming it to be a three part type, the most difficult charge to be developed will be the demand. An equitable customer and commodity charge would readily be arrived at, once that charge was worked out."

### Material Helps

Merchandisers are of the opinion that such a change in the rate structures would immediately encourage the use of such appliances as the gas refrigerator incinerator, laundry dryer, ironer, radiant heaters, house heating and the more general use of the continuous flow water heater. The result of this added use of such appliances in the home would be the greater development of the industry which in turn would result in economies that would lower the commodity charge. Aside from this, with the more general sale of existing lines of merchandise, manufacturers of such appliances would also effect more economies and develop new appliances, sales aids and greater customer acceptance through the use of National and other forms of advertising. The whole would bring additional happiness and efficiency to home work.

While the foregoing facts are the findings of men who are forward looking, we still have with us, those who view any talk of dwindling markets from another angle. These men say; "where complaint exists, it is what the dealers do not do, not what have you, that is responsible for any slow-up in sales."

These men contend that the dealer has all the essentials of selling; markets, merchandise and helps from the manufacturer, that he has finance, organization and location, but that he does not follow through.

"The best sales plans and the best merchandise in the world, just will not build sales volume, make happiness in home work or afford the gas company added

sales per meter unless it has an organization back of it pushing it to the front."

Men who know their gas appliances say that many costly campaign plans find a final resting place in a desk drawer and that much costly literature at this very moment reposes in the rubbish heaps of many warerooms, unopened. Yet it will be found that the very men who dumped this material are in the dolefuls, complacently claiming that; "business is not what is should be—folks don't cook like they used to" and "we don't have the attractive merchandise that merchants in other lines do; etc., etc."

However, these merchants are in the minority and the gas man at large is cashing in on the aids offered him by the manufacturers, by and large, and doing a lot to help himself retain and build up the domestic sale per meter.

Gas companies in many instances are departmentalizing the activities of "the new business department." Departments will now be found in charge of an Operating Vice President, under whose direction will be found specialists in planning, employee education (sales), store management, sales management, advertising and display. This department, in the case of the large operating companies "syndicate" from their general headquarters to all branch or district sales managers, in charge of merchandise sales, the results of their research, trials and investigations, in the form of tested educational matter, window display ideas, sales plans, advertising and other helps. They are tuning into the times, cashing in on the ideas and experiences of the much talked of chain organizations as well as creating many new sales ideas applicable only to home appliance merchandising. All of which goes to prove that the gas industry is coming into its own and that the New Era will be known to history as "The Gas Era."

## A Big Job Ahead

It seems that the job of the gas man for 1930 is a bigger one than ever before. With gas sales per meter dropping off here and there, due to the constant changes in trends and tempo, the merchandising department will of necessity also have to become a development department. The gas man will have to know and chart his markets and do specialized selling. He will have to cultivate the territory across the railroad tracks and ask those living in the high rent districts to buy.

The day of introduction has dawned for *the full line of home appliances* and instead of devoting ninety per cent of our time and effort as well as our advertising to sell gas ranges and circulating gas water heaters (to effect large replacement sales) more time, thought and effort will have to be given to devising ways and means of penetrating the apartment house market, the commercial market, the industrial districts—that is, if we are going to make each meter set a profitable one. Also, another thing that will of necessity have to be done is to conduct new saturation surveys of the desirable "middle class" neighborhoods in order that salesmen may be sent out with specific instructions as to what to ask folks to buy.

## This Ad Punctures An Old Idea

Here is an advertisement that may prove of interest to gas men here and there. The play is made that the heater advertised "Actually Saves 26% of Your Gas Bill." We'd say that such a claim would have a big general appeal, for as

Actually Saves 26% of your Gas Bill
JUST think... a new type water heater that will actually cut gas water heating bills by fully 26%.
Here is just the opportunity you have been looking for, to replace your old style heater with a new, efficient "Pittsburg-Monarch"... a practical heater that will give you a lifetime of steady service and show a saving of gas all the way through.
The Most ECONOMICAL Water Heater on the market
PITTSBURG
MONARCH WATER HEATER
Built By Experts
Enjoy Hot Water Service
See It Now!
NO OBLIGATION

yet we do not remember having met but a very few people who did not say that their gas bill was too high—of course without giving the matter of the convenience of gas service any thought or without comparing the cost of gas with anything else they purchase and pay for, either before or after they used it.

## Checking Up Advertising

If you can't check your advertisements try coupons. There are enough coupon clippers in your town to prove to you that folks do read advertisements and how. Try it out but do not expect the postman to be weighted down with coupons the day after you run your coupon ad. They do not work that way. The number of returns, checked against the newspaper's circulation or your prospect list will give you a percentage to check against and two or three of such trials will give you an indication of how your ads are pulling. But this is a big subject, the law of averages, yet it works

and from the way in which one of the greatest gas company selling organizations in the world uses coupons we are of the opinion that it must produce.

When you decide to use coupons keep track of results and work with them until you secure average results from various methods of approach. It can be done and once the average is struck you may depend upon it in connection with other activities.

## The Customer's Fourteen Points

When we read H. T. East's article, "The New Customer," in a recent issue of *American Gas Journal* it recalled to mind John Wanamaker's Code of Ethics filed away in one of our scrap-books. In an interview with a newspaper man Mr. Wanamaker said; "there are codes of ethics for this, codes of ethics for that and everything. But the code used by the great Wanamaker store in New York is the one revealed in the thousands of transactions with customers daily.

"You can shout the virtues of your store to your community, but the people who come through your door will form their opinions by the treatment they get.

"And here are the ways they find you out:

1. The way you greet visitors to the store.
2. The manner in which they are waited upon.
3. When and how you advertise.
4. How you display what you advertise.
5. How you back up what you have to sell as well as the merchandise itself.
6. Treatment by those who handle the credits.
7. Treatment by the cashier receiving payments.
8. The collection letters you write.
9. The weak-spined, or firm but friendly stand on prompt payments.
10. Service you render on deliveries.
11. Condition of merchandise when delivered.
12. Courtesies, or lack of them, shown by your delivery man at and in the homes of your customers.
13. Your method, or lack of it, in following up transactions.
14. The courteous or discourteous methods of your telephone operator.

These fourteen points have most all

been covered in a manner that will prove highly profitable to any gas man who puts them into practice as well as any part thereof.

### The Plan Book

Indeed not; if you have no plan you can't perform; that is, perform well in the business of selling. A plan book is simply a guide book or a typed or printed reminder in which you enter, for example, the idea you conceived of selling fifty gas fired clothes dryers and the way you said you would do it. The plan book is the thing you have to remind you how to advance your program.

### How Do You Explain This?

Aside from the fact that "everyone lives in apartments or 'out'" the Fore Cast School of Cookery, conducted by Roper, received an average of three hundred and ninety-eight inquiries per day for the first twelve days broadcast this year. There were forty-seven hundred and eighty-three inquiries, to be exact, which evidences the fact that folks can be and will be interested in most anything if properly presented.

The direct inquiries indicate to anyone who is a student of human reactions that thousands were made more cooking-conscious by these twelve broadcasts and cooking has begun to look-up in as many homes as a result.

Broadcast your story of gas via every known medium.

### Shop at Home

Keeping the dollar at home at Christmas time is a job that the retailers in every community are confronted with each year. Shop at home is their slogan and now comes a group of gas companies who are getting into the movement and doing their bit to get folks to shop early and shop at home.

This group of companies uses a little Santa like the one we reproduced below in all of their merchandise advertising between November fifteenth and December twenty-fourth. That, it seems, is good will building in a big way and it is our opinion that merchants in the cities served by this company must appreciate this type of cooperative effort.

### Paste This In Your Scrap-Book

WANTED: To know what's become of the gas range salesman (manufacturer's) who was wont to strut his stuff by conducting an honest-to-goodness baking contest in the gas company's store—and having every woman that entered the place stop, look and listen.

He was a salesman who developed new business and made sales right off the bat. No hidden demonstrations by those boys; they were right out in the open baking and serving biscuits to all comers and having the women saying; "that must be a wonderful gas range, if mere man can bake such wonderful biscuits, cakes or what did they bake, with so little effort."

"Boy Page" Jim Wheeler, "Speck" Anderson and "Bill" Withers,—we want to sell more gas ranges.

### Reviving the Old Pep

According to our midland upbringin' there's nothing that will make a fellow more dissatisfied with "what have you and what you are doing to bring happiness to the home manager," than travel. If business seems to be going to the eternal bow-wows, advertising fails to attract and the sales force is not on its toes and you are sure it is not your liver, a trip out of town will tone you up mightily.

It frequently happens that we stay too close to our business to see it in its proper light. We either get cock-sure or rusty and either condition cramps our sales. A trip to another city, a talk with other merchants, not necessarily in our own line (and a visit to other stores all provoke new ideas and stimulate our selling slant.

Conventions likewise provide such tonics, when the time spent at such gatherings of kindred spirits are properly allocated; certain periods set aside for attending the business sessions, certain times for visiting manufacturers exhibits and a certain time for recreation and amusement and visits with friends. However if a definite program is not planned the average man becomes like an amateur radio operator groping in the ether, he gets something now and then but he is not quite sure just what it is.

### A Good Effort

"Effortless Heat" is the title of a very worth while folder being used by the Consolidated Gas Company, New York, in selling the idea of gas as a fuel for house heating to home owners in Flushing, L. I. and other municipalities in the vicinity of New York City. The folder, printed on a canary colored cover stock in light orange and black, is nicely illustrated with pen and ink drawings and is accompanied by a dozen photographs of homes that are using GAS, "the effortless heat." The photos are printed on the face with the name and address of the owner, location of the property, square feet of radiation required to properly heat the building and the cost of heating it for one year with gas. Aside from the photographs, there is enclosed an inquiry card, first class postage paid, for prospective customers to use in securing further information. 1929-1930 House Heating advertisements such as this are in tune with the times.

### How to Get Results

To turn lookers into buyers try changing your window displays frequently and tieing them into your newspaper advertising. Where there is no one in the sales department who can make up backgrounds, try playing colored lights on the appliance. If color is the vogue why not capitalize on it and play it up with colored window lights.

### A Big Question

If, at the end of this year your sales per meter have not shown an increase, in the language of the street, "it's just too bad," but not bad enough to get any more grey hairs about. The big question, "How come?" may help you some but not nearly so much as the question, "What are you going to do in nineteen-thirty?" That is the question that you should begin to solve. Knowing ones say: "plan your work and work your plan" and that is sound advice.

*Now* is an ideal time to set up your quotas, to decide how many ranges, water heaters, radiant heaters, laundry dryers, incinerators and refrigerators you plan to sell during the coming months; how much money you can afford to spend for advertising, how you will stage your window displays, how you will brighten up your store displays and put your sales people on their toes, how you will properly inform them in regard to the merchandise you expect them to sell and how you expect to show folks what said merchandise will do for them.

This is a big job and one that will cause you to forget paper losses and get through the bleak days following the holiday season in good shape.

They said it couldn't be done but here it is!
Only $5 down
balance in 15 months
WHEN the Automatic Washer Company brought out the new Automatic Duo Disc to sell at a low price competitors laughed. They said it couldn't be done. "Impossible," they cried, "to put out a high quality machine at such a low price."
But expert engineers had designed and constructed this new washer. They had adopted a principle that had proved highly successful in the automobile industry . . . pressed steel was used in the new Automatic. This not only improved the machine but it reduced production costs so much that the new washer was put on the market at a new low price.
The Automatic Duo Disc. The only washer with the invertible agitator.
THE success of the Automatic Duo Disc was so great that within a year the Automatic Washer Company had jumped from seventh to third place in the industry. From all parts of the country came enthusiastic comments from satisfied users. The new Automatic was a sensation. It simplified the task and shortened the time. And now we present this popular washer to St. Louis. Have it is, offering you many new features never before to be had, even in high priced washers.
The special copper coil attached gas water heater is an outstanding feature of this washer. This heater heats the water in the tub and eliminates the carrying of water from boiler to washer. It saves time and labor. During the canning season it is especially useful in cold pack canning.
Another feature of the Automatic Duo Disc is the 10 year Service Guarantee Bond
Don't fail to see and inspect this sensational washer. It's on display at all four Laclede stores. You'll need only a few minutes to see why the Automatic Duo Disc is so popular the country over.
The LACLEDE Gas Light Company
OLIVE AT ELEVENTH ~ ~ Phone CEntral 3800
3100 S. GRAND 3534 N. GRAND 2754 CHEROKEE

## An Ad with a Punch

"Dynamic," that's what we'd say about the Laclede Gas Light Company's advertisement featuring the dual Automatic Washer with the circulating gas water heater attached. Aside from being a dynamic advertisement it is an interesting one to the gas man who wishes to go after the home laundry business with a new idea for the home manager. In addition to using the appliance as a washer it will be noted that the Laclede Company recommends that it be used "during the canning season in cold pack canning."

Paste this one in your scrapbook for future use.

## Price Precautions

"Those who frame gas company merchandise advertising will do well to use caution in the matter of quoting prices," said the advertising manager of a gas company. "Comparative prices should be avoided if possible, and be checked very carefully when used. I mean by this that it is well before advertising that, 'this is the lowest price' you have ever made or the best terms, to check back over a year or two and be certain that you are stating facts.

"Women remember prices and are very apt to check you up on statements that are incorrect. A woman of our acquaintance told us that whenever she is in the market for anything that calls for an outlay of over five dollars she shops around through the newspapers for several days and in some cases for several weeks before she finally makes the purchase and that she is always very careful to avoid sacrifice prices. She also said that oft times women delay purchases for as much as a year for the very reason that there seems to be such a wide range of prices in advertisements, she cannot determine the article's real value."

What this man says is in direct line with the AMERICAN GAS JOURNAL's idea of advertising as well as that of advertising associations and men generally; that only truth in advertising pays and that the less we compare prices the better.

## The Same Person

"Your Business may be 'different' but, the woman who buys from you is the same HUMAN BEING who buys ginger ale, face powder, and tooth brushes. The same strategy, dressed in different clothes, sells her a washer and ironer for her laundry or a tapestry for her living room.

A great many gas men are very well aware of this fact as is evidenced by the manner in which they are approaching the home manager. They are employing the appeal, *What It Will Do For You*, in interesting her in many of the appliances that are so essential to the well managed home.

## Window Efficiency

Window display advertising is one more way to increase sales by suggesting new appliances and new uses of appliances to folks over and over again. Give your windows a chance to work for you all day and up into the night by changing them frequently and lighting them properly.

Make the gas company's store stand out in the night, make it the brightest place in town. Good window lighting is one of the cheapest and best forms of advertising. Many merchants have found that by installing proper lights in their show windows sales have increased many times. If your windows do not "show-up" properly during the daylight hours the installation of light is advisable.

## A Satisfying Xmas Gift

Don't overlook the selling of Incinerators during the present Christmas shopping season. During the holiday season alone this appliance will win its way into the heart of the housewife and she will wonder how she ever got along without it.

**THE NEIGHBORHOOD GETS THE NEWS**

***about***

**Jones' Rubbish Heap**

A long, yellow twisting cloud that curls from backyard to backyard. A sickly odor. Jones is burning his rubbish. Neighbors are frantically closing windows and doors. Here is Jones himself—eyes smarting—hands, face and clothing smudged. "What else can I do?" he asks peevishly, "it has to be burned."

There's just ONE answer to that: the GAS INCINERATOR. It provides instant disposal for trash, and it is the *only* sanitary dispenser for germ-breeding garbage. Rubbish which is allowed to accumulate for back-alley-burning is a fire hazard; records prove it the most common source of fatal conflagrations.

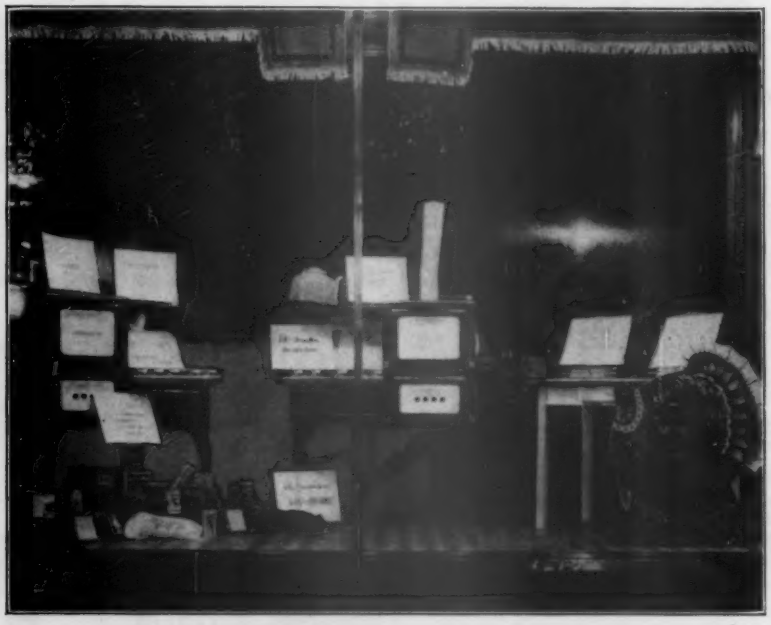
***Put the lid on troublesome, treacherous rubbish — once and for all — with a Gas Incinerator. Now on display at***

**(Your Name and Address)**

A.G.A.-1054

Tell the prospect how the Incinerator will dispose of the wrappings on the presents on Christmas morning in a jiffy. Remind her that the quantity of food waste is particularly heavy at Xmas and that the garbage man is very likely to be tardy in making his rounds. Sell 'em Incinerators.

# Selling three hundred gas anges in six days

*By W. B. Stoddard*

*A window that assisted in selling many ranges*

THIS is the story of a sales campaign that is worthy of emulation. Though put on by a hardware firm any gas company could duplicate it and the greater window space of the average public utility company would enable them to give far greater publicity to the ranges.

People passing the store of Huey & Philip Co., Dallas. Texas, one morning in early December saw in the middle of the window a gas range, the oven wrapped in newspaper and a joint of pipe wrapped in the same material. One of the gas jets was lighted and 18 inches above it hung a teakettle steaming away. Was it any wonder that a crowd collected in front of this unusual display. At one side of the stove was grouped a collection of standard groceries to the value of $7.50. At the other side was the life size cut out of a big turkey. Cards announced that all of these groceries, together with a fine large turkey would be given free with the purchase of a gas range during their big six day pre-Christmas sale. In addition to all these premiums $5.00 was allowed for the old range, regardless of condition. Best of all, the stove could be secured in time to cook the Christmas dinner, with a payment of only $5.00 down and the balance in regular weekly or monthly installments.

"We hold the record for sales of this particular brand of gas range," said Paul H. Speaker, vice-president of the firm, "and I guess there is scarcely a man or woman in Dallas or vicinity, who is not acquainted with the merits of this stove, and that we are the selling agents.

"There is a steady sale of stoves the year around, but twice a year in the spring and the late fall, we stage a special sale, in order to speed up business. These sales are never prolonged beyond the stipulated six days and our special prices are strictly limited to the sales period.

"The details of the sale are carefully mapped out in advance, and all of the ads arranged in the order in which they are to appear. On the Sunday preceding the sale we come out with our broadside, announcing the terms of the sale and the premiums offered. These differ with every sale. We always select something from our own stock, as it gives us greater publicity for our other lines. At one time it was an aluminum roaster; at another a pyrex set. It is surprising how many people buy to take advantage of these accessories. I know personally of several families that have bought two stoves at different times, trading in their old ones, and getting a new model and some high grade kitchen ware or table appliances. We do not pay for the groceries we give out, as they are supplied by the manufacturers of these products, but the value to the consumer is just the same.

"We do not hand out a turkey with each stove sold—such a plan would not be practicable. What we do is to take the name of each purchaser and then at the end of the sale, after having ascertained the number of turkeys needed, we go down and contract for them in open market, the birds being delivered to each patron on the morning of December 20th.

"The first announcement of our sale is practically a page spread, and the succeeding ads are one-half page, column length. There is a different ad run each day of the sale, to give variety, but all stress the leading features of the sale—the 10% discount, partial payment, no interest, free turkey, free groceries, etc. All of them have catchy headings such as:

**MY! MY! HUSBANDS AND WIVES Are Talking Fast Among Themselves**

*You see this sale of gas ranges has come long enough before Christmas to get men, particularly, to think things over and give their wives or mothers the most heartful, healthful and happiest of Christmas gifts.*

*But women are doing most of the choosing. Perhaps that is after they've talked it over with their husbands--we don't know. We imagine, however, that many a big manly husband says, "Mamma, you'd better buy a gas range in this sale today or tomorrow at Huey & Philips, while you can get those groceries and turkey free."*

**HERE'S THE BIGGEST CHRISTMAS HAPPINESS YOU'VE EVER HAD**

*There'll be Plenty of Happy Cooking This Christmas*

*The crowning meal of happy gift time--the Christmas dinner—can be cooked this Christmas Day on the famed range that women everywhere will tell you proudly "They bake better."*

And then as the end of the sale approached, they said:

**TOMORROW—LAST DAY**

*Don't wait another day to get your Christmas range—We have done our part to help you to cooking happiness—you should do yours.*

*"Watch and Wait" are a good team, but if they don't bring you here tomorrow, they'll take you in the wrong direction—and we will all be sorry—at Christmastime.*

"There are three afternoon and one morning paper in Dallas, and we figure that each has its special clientele. Therefore, instead of using one paper daily we use the afternoon papers in rotation, the same ad appearing in the first on Monday, in the second on Tuesday and in the third on Wednesday. Then on Thursday we start with the first paper again, and repeat the same ad in the other papers on Friday and Saturday. We advertise every day in the morning paper. On Friday we come out with another big ad, reminding the public that "Tomorrow is the last day in which you can take advantage of this splendid offer.' It is strange to note the psychological effect of this ad. On the last day the store is crowded with buyers, and we generally sell twice as many ranges as on any of the other days. Last fall we sold approximately 300 ranges at our sale, and of these, 115 were sold on the final day:

"During our stove sale the whole force talks gas ranges. A person coming to any of the departments is asked by the salesman to visit the gas range section and sample some of the delicious food prepared by the demonstrator, and learn more of the good qualities of the stove.

"We do not stress the premium features in our selling talk. We let these extras speak for themselves by displaying

*(Continued on page 59)*

ABILITY TO SERVE

# THE WORLD IS OUR FIELD

ABILITY TO SERVE

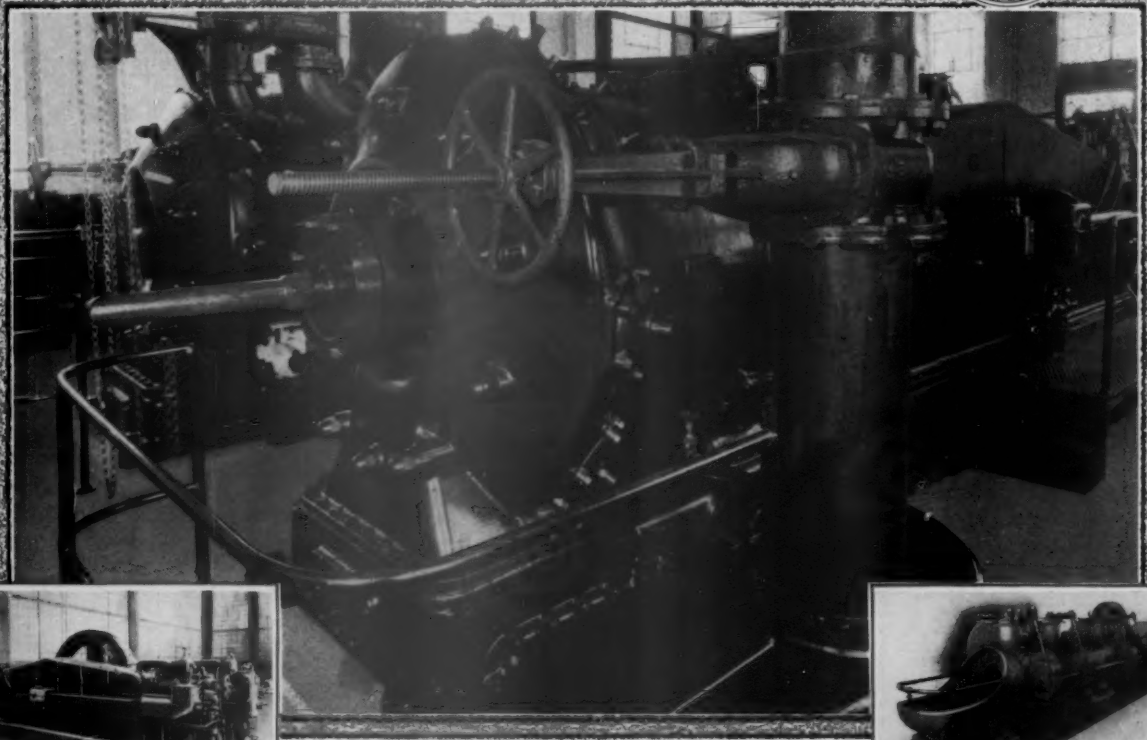
AT this Season of Good Cheer we are mindful of our many good friends throughout the gas industry. To them and theirs and to all gasmen the world over, go our best thoughts and sincere greetings for

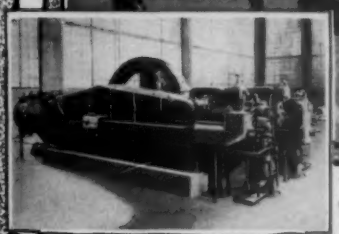
## A Very Merry Christmas

The STACEY BROTHERS Gas Construction Co.

NEW YORK OFFICE—75 West Street CINCINNATI, OHIO New England—Eastern Service Co., Boston

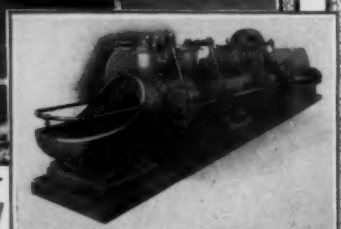
# USE GAS
## TO COMPRESS GAS!





Cooper-Bessemer Type-80 is built as a single cylinder—85 B. H. P., or as a twin cylinder—170 B. H. P. unit for compressor and booster service.

WHERE THE LOAD FACTOR IS LOW
WHERE THE PEAK LOAD IS HIGH



Cooper-Bessemer Type-19 is built in standard sizes from 200 to 760 B. H. P. in four combinations of cylinders for compressor service.

**It is sound business to utilize your own product—when, by doing so, you save money and get sure results.**

**Cooper-Bessemer Gas Engine driven Compressors** operate on manufactured gas. Used in the main plant as a stand-by unit to the electric motors, a Cooper-Bessemer eliminates the investment and maintenance of a steam plant. Used away from the main plant for high pressure transmission with low load factor, the over-all cost of its use is less than for either steam or electricity. Accessibility, reliability and low-cost operation are the points that will appeal to you. Write for details.

THE COOPER-BESSEMER CORPORATION

Formerly The C. & G. Cooper Company and The Bessemer Gas Engine Company

Mount Vernon, Ohio Grove City, Pa.

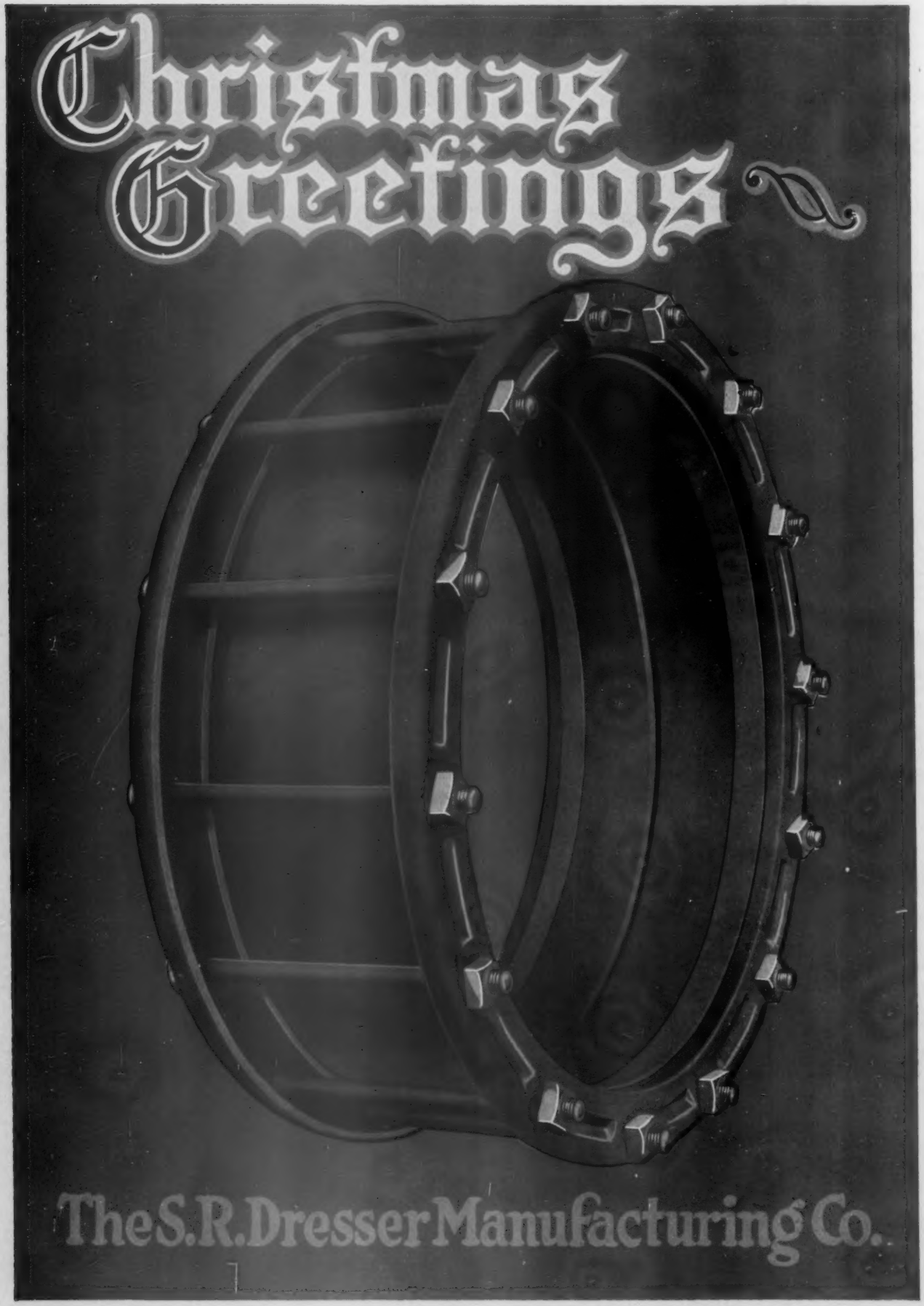
*Branch offices in all principal cities*

To the Members of the
GAS INDUSTRY
*Everywhere*
We wish you a Heartfelt

Merry Christmas!

and a
Happy Prosperous New Year

SAFETY GAS MAIN STOPPER CO.
523 ATLANTIC AVE. — BROOKLYN, N. Y.


Christmas
Greetings
The S. R. Dresser Manufacturing Co.

### Selling Three Hundred Gas Ranges

*(continued from page 54)*

them in our ads and in our show windows. What we stress is the economy of cooking with this modern range, and the fact that by purchasing during the sale the customer obtains a new stove on which to cook the Christmas dinner, and is given abundant time in which to pay for it. The same demonstrator cooks in the window and in the gas range section, and when she is demonstrating in the window one of the salesmen supervises baking operations in the stove section.

"In addition to increasing the sale of gas ranges by this semi-annual sale, the many new accounts opened and the many patrons it draws to the store each week or month to pay their installments, makes it one of the most valued advertising stunts we have ever inaugurated."

# Let's Sell More Than Merchandise

***By Norman B. Terry***

*The Laclede Gas Light Company believes in stressing quality, both in selling and in advertising. Here is the Refrigeration Salon located in the mezzanine floor. It is furnished with rugs and comfortable chairs; decorated with palms and ferns and bathed in soft, colored lights*

OBVIOUSLY, to successfully compete with competition the gas company must offer inducements that other appliance merchandisers do not or cannot give. The people must be told of these inducements through advertising in the newspapers, windows and direct mail. By constantly impressing on the public the fact that in buying gas appliances at the gas company they secure additional benefits and advantages which they would not get elsewhere, the gas company strengthens its position as the logical place to purchase gas appliances.

In most cities the gas company has for a long time delivered the best possible service thereby gaining from the people a certain amount of confidence. This fact furnishes material for good institutional advertisements. This type of advertising, after all, helps sell merchandise by telling the public of the part the gas company is playing in the life of the community.

It isn't a bad thought to work some of this institutional or good will information into merchandise advertisements, for it lends an atmosphere of reliability and dependability to the company's message. For instance, in selling gas ranges the gas company might adapt an idea which proved successful for a Texas jewelry house a year or two ago. A cash prize was offered for the oldest piece of merchandise bought from this firm. Authentic proof of date of purchase was required and a history of the merchandise was requested. A genuine interest was exhibited by people throughout the entire community and so great was the response that it was necessary to erect a special display counter to accommodate the many pieces of jewelry sent in to this exhibit.

A gas company could follow the same idea by offering a prize for the oldest range bought from the gas company and still in use. The prize-winning range could be used in an interesting window display and would furnish excellent material for newspaper advertisements featuring the stability and reliability of gas company ranges. This is the sort of advertising and publicity that creates an unusual amount of real interest among possible customers and instills in the public the belief that the gas company is the best place to buy gas appliances.

Although there is a general trend among utility advertisers and salesmen toward the dispersing of interesting and informative news about appliances, there is still much to be done in educating the public relative to the benefits derived from purchasing gas appliances from the gas company. There are a lot of salesmen and a lot of advertisers who have a great deal to sell besides merchandise, yet all they advertise and all they talk about is merchandise. They talk but little about the thing that the customer is really buying, which is not the merchandise itself but the service, the comfort and the satisfaction that the merchandise gives. In order to successfully compete with the price competition, which is becoming stronger each day, the gas company must lay stress on advantages that others cannot or do not offer.

### Up to the Salesman

Salesmen must know their merchandise thoroughly and they must be familiar with the process of manufacture. Here is where the gas company can forge ahead of its competitors. Take, for instance, gas ranges. These appliances are sold in many places other than the gas company. They are sold by sales people who sell a wide variety of things, from ships to sealing wax. Consequently, these salespeople haven't the time to make themselves thoroughly familiar with the ranges. In all probability none of them have been through the range factory to watch the making of the different parts and the assembling of the completed range. They know a few of the main selling points that any normal individual could recognize, but they don't know their ranges like an automobile salesman knows his car, or a radio salesman knows his radio. Gas appliance selling is a specialized field, requiring a thorough knowledge of the merchandise, inside and out, and an ability to quickly grasp each individual customer's needs and to advise him intelligently and helpfully.

Salesmen are often confronted with this statement by cantankerous shoppers: "I saw a range exactly like this one down at Smith's Variety Store and their price was twenty dollars less than yours." In order to offset this argument the salesman must be able to tell the customer why the gas company range is really worth the difference. Brand names sometime mean very little to prospective customers,—they want

reasons. There are many ranges sold whose appearance is similar to the gas company ranges but whose quality is much inferior. Of course appearance is to be considered but it isn't the most important feature. The quality of the materials, the efficiency and dependability of the range, are things that con't be overlooked if the purchaser wants to be satisfied.

The American Gas Association through its laboratory at Cleveland has done much work in assuring the public of the reliability and dependability of appliances sold by member companies. This fact should be emphasized in all appliance advertising and by the salesmen selling the appliances. Gas companies can't afford to sell an inferior or inefficient article because the public has learned to have confidence in the company.

### Bad Appliances Damaging

Defective and inefficient appliances tend to destroy the public's faith in all gas appliances. Suppose a customer has had some unpleasant and unsatisfactory experience with a gas range or gas water heater. He naturally calls the service department of the gas company to remedy matters. Regardless of how tactful and soft-tongued the service man may be, he cannot dispel the individual's idea that the gas company's service is partly, if not wholly, to blame. One unpleasant experience might fill an ordinary person with incredulity and skepticism toward anything and everything connected with the gas business. This person's animosity sometimes spreads among his friends and acquaintances and might create considerable ill-will.

Service is another important factor in the sales policy of the gas company. The service men are all experts with years of experience behind them and when they install an appliance the customer can rest assured that it is installed right. They are in an excellent position to build confidence and prestige for their company. In order to be able to repair and service appliances these men must have a thorough knowledge of the construction and operation of all gas appliances. Customers know this and consequently believe in the authenticity of the service man's statements. It is plain to see the illimitable good these men can do their company in a sales way if they are coached to seize every opportunity to exploit their company's merchandise. Many companies are utilizing this opportunity and are offering cash bonuses to non-selling employes who turn in leads that result in the sale of gas appliances. However, this sales channel could be made much more productive by a more thorough and concentrated effort on the part ot the sales department to enlist the co-operation of the service men. These men go into homes—theirs is the opportunity to observe the lack of certain gas appliances. A few words to the prospect in praise of these appliances and a hint turned in to the sales department will bring to light many opportunities for gas appliance sales which would otherwise never be known.

Easy terms is another feature that most gas companies can offer their customers. Usually these terms are better than those of "bargain selling" competitors. Time payments are extended over a longer period and down payments are less. Credit is usually given without question to anyone whose name appears on the company's list of gas users.

*The headline of this ad tells a powerful story*

All these factors are real inducements to the public to buy gas appliances from the gas company. These are features which should be incorporated in all gas company advertising and salesmanship. Not, however, to the exclusion of desire-building information, for there is much to be done in the way of presenting to the public the time and labor saving advantages of gas appliances. These features must also be emphasized in gas appliance advertising and salesmanship. The people must be told what the appliance will do and how it will do it. They must be shown how they will benefit from possession of the appliance. But this educational information should be backed up with good sound, logical reasons why the gas company is the best place to buy gas appliances.

### Buy Controlling Interest in Gas Company

The Midland United Company, an Insull holding company has bought a controlling interest in the Columbus Gas Light Company of Columbus, Ind., from the Great Lakes Utilities Corporation. The Midland United Company owns and controls several public utility companies serving 682 communities in Indiana, Ohio and Michigan.

## Gas Appliance Displays for the Holiday Season

***By Chas. N. Tunnell***

GAS appliance sales during the Christmas holidays depend to some extent upon the appeal of the holiday displays. It is not necessarily the most beautiful display that has sales appeal—often it is the simple inexpensive display that scores an impression upon prospects to create ownership desire.

A little early planning of Christmas displays will mean in many instances that prospects make it a gas appliance Christmas present in preference to dozens of other lines of merchandise that are all competitive for the buyers' dollars.

A Southern gas company furthered sales in its commercial department last season by a series of early holiday windows, putting the spot-light, so to say, on one gas appliance at a time. The first of these displays made featured gas ranges as an ideal for wife or mother.

### Set-up Of Modern Kitchen

A model kitchen scene was built in the display window in the usual way. The background of the window represented the outside kitchen wall, a large window in the background representing the kitchen window. The central figure of attraction was a silver-haired card-board cut-out of a life-size woman standing to the front and one side of a new gas range. The oven door was open, she was in the act of lifting up the top half of a large roast pan to reveal a brown turkey. A large Christmas card reading, "Merry Xmas Mother. From Dad and Son," was attached to the colored range.

Dad and son were present, too, in this display, or rather peeping in at the window. A card-board cut-out of a man, one of a bay, and one of Santa himself was shown through the window. All were smiling. Dad to the one side of Santa and Son to the other side. Santa had his arms around each, as all three were eagerly watching the proceedings taking place in the kitchen. A bit of tinsel, crepe-paper streamers, holly and bells gave the window the holiday atmosphere. A card suggested, "Oh, Boy, Roast Turkey and all the Trimmings. Wouldn't Mother be tickled to cook Christmas Dinner on a New Range Like This One."

Other cards over the window prompted early shopping to get connection made during the holidays and other points calling attention to the common-sense plan of giving a practical present.

Following the range display, a gas refrigerator was placed upon a small platform built to the center of the window space. The background to the window was decorated in celofine cloth, while streamers of Christmas rope of colors, tinsel and silver-spray was used for making a proper setting. The snow-white gas refrigerator was placed in its elevated position, which was covered in fluffy cotton sprinkled with imitation snow.

A Santa Claus was standing, life-size, to the one side of the refrigeration unit. Santa was in the act of bowing to the public and waving with one hand; in his other hand were the ends of twelve colored ribbon streamers. The opposite ends of these streamers led to neatly lettered placards over the window, each card emphasizing the merit of the gas refrigerator and serving as one of the twelve reasons why the unit would make an attractive Christmas present.

An incinerator and other gas merchandise were featured as ideal holiday gifts during this series of displays.

Another gas company which also does gas piping used window displays last season to sell more connections and put gas in some old homes that had not previously been piped for gas. The theme of comparison was used for this display.

A model house built from heavy building board represented the average city home. This miniature house was complete in most respects, openings being cut for windows and doors painted on the building. The window openings had glazed grey paper pasted over them from one-half to three-fourths of the way down, representing window shades and to give a proper lighting effect at night.

The model house was painted and placed on a terraced building lot, bits of shrubbery, etc., being about the yard. Imitation snow covered the floor space and was hanging over the trees. This was effected by first taking cotton and pulling a thin screen over the small trees and then covering the cotton with snow.

To the front of the house, a toy automobile was parked. Soaring in the air above the house and suspended from the ceiling by a white string was a toy airplane. Santa could be seen leaning out of the cockpit waving down to those below.

One card in the window reasoned, "Even Santa Takes to Modern Methods. Give the family a delightful present by modernizing the house with gas piping and appliances." A second card in the window showed the average domestic gas bill paid monthly by families of the city, while other figures showed the cost of using other forms of fuel.

Somewhat institutional, yet tying up with gas and its modern advantages was a Christmas display used last year by a Western distributing concern just prior to Christmas. The display was commonplace enough, but true to life and simply made. A model fireplace was made by covering a cardboard structure with red crepe-paper, then checking it off with black lines to represent brick. A gas-log was kept glowing at night in this fire place, while several stockings were hanging to either side from the mantel.

Two kiddies in nighties were reaching for their well-filled stockings. A placard bearing a Santa face announced, "Everybody is happy in a gas served home." A second card in the window stated, "Make the Christmas spirit last throughout the year—give gas appliances."

Christmas displays to stress gas appliances or to emphasize the superiority of gas over other fuels need not be complicated or expensive.

# Drawing Visitors

***By John H. Hartog***

THE accompanying picture gives one a fair idea of the beautiful Dahlia Show which was held in the Display Rooms of the Portland Gas & Coke Company, October 12th and 13th.

In order to make room for this display, the gas appliances were temporarily moved back so that the Columbia Valley Dahlia Growers' Association could occupy almost the entire space.

*How Portland staged an exhibit that drew prospects*

The design in the foreground, with the fountain in the center, was the actual center of the exhibition. Soil was placed on the tile floor, with rock borders, palms, evergreens and ferns abundantly in evidence.

The picture was taken at a time when there were very few people in the room, which hour was of course selected for obvious reasons, but during the busy hours of the days and also in the evenings, especially Sunday, hundreds of people were present, and many prospects were secured for modern gas appliances.

At the entrance doors to the right stood the new "Magic Chef" gas range, which drew the admiration of many women, while of course everybody was attracted by gas refrigeration.

## Home Economics Charts

A SERIES of six charts dealing with the management of the household refrigerator has been prepared by the Bureau of Home Economics of the U. S. Department Agriculture. The charts show the temperatures required for the satisfactory preservation of different foods, and in graphic form present some of the principles of household refrigeration recognized as important to health.

With an efficient cabinet, the charts point out, temperature low enough to keep foods in sound condition can be maintained either with ice or a mechanical unit as the cooling agent. Whatever the type of cabinet or whatever the method of cooling, the coldest place in the box should be located and reserved for the most perishable foods. A series of diagrams show how the temperature in dif-

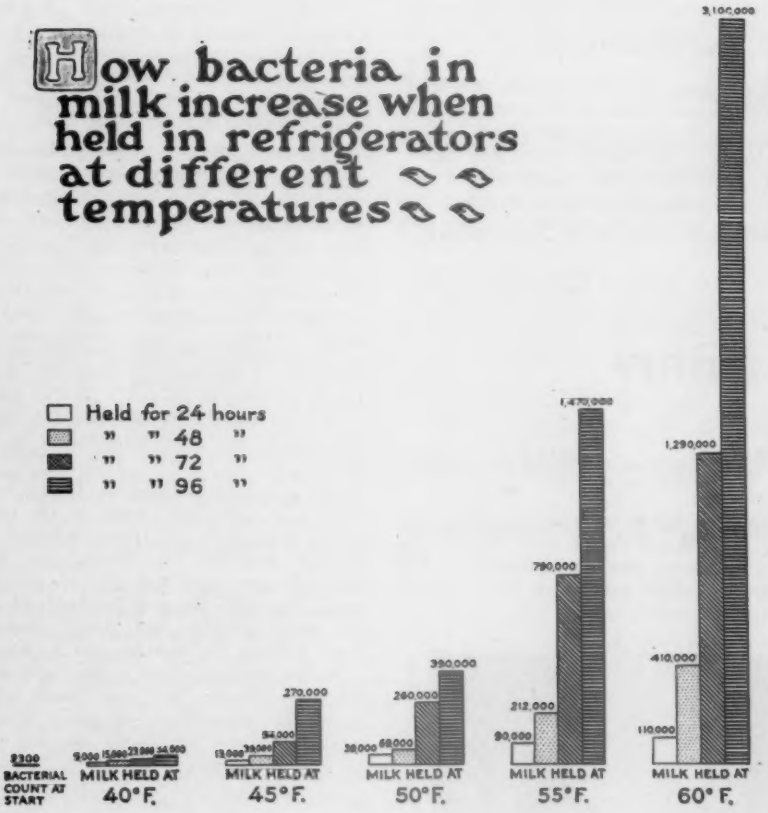
ferent parts of the box varies with the design.

How to handle raw and cooked meats and the rate of increase of bacteria in milk held at different temperatures are shown by pictures and graphs.

The whole series of six charts, 16 by 20 inches in size, printed in black and white on heavy paper, may be bought for 20 cents from the Superintendent of Document, Government Printing Office, Washington, D. C.

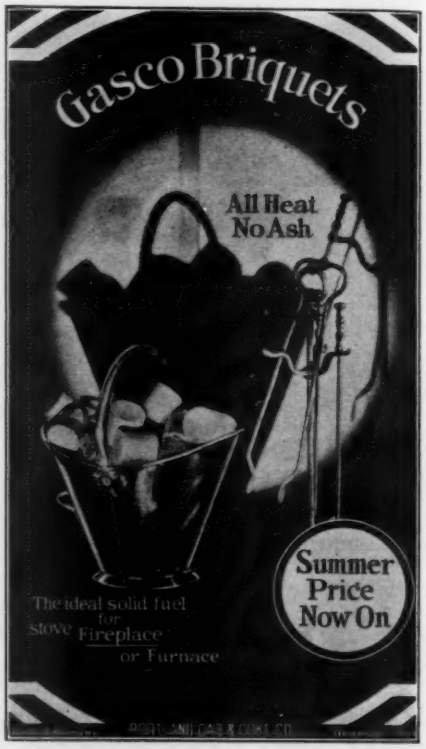
HOUSEHOLD REFRIGERATION CHART 4

# COLD CHECKS BACTERIAL GROWTH

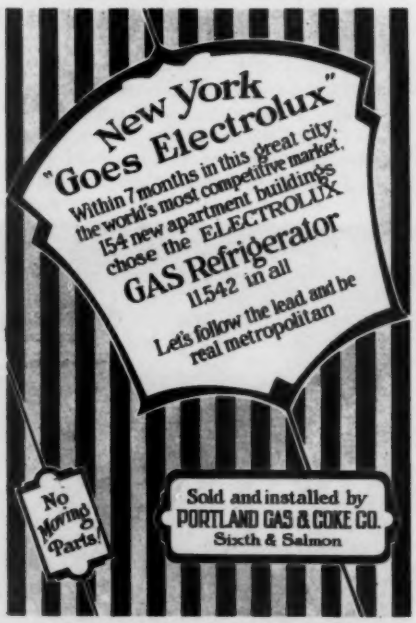



BUREAU OF HOME ECONOMICS—UNITED STATES DEPARTMENT OF AGRICULTURE

*Refrigeration Chart issued by Department of Agriculture*




*Two ads in the Modern Manner that are novel and in keeping with the times*


"New York
Goes Electrolux"
Within 7 months in this great city, the world's most competitive market, 154 new apartment buildings chose the ELECTROLUX GAS Refrigerator
11,542 in all
Let's follow the lead and be real metropolitan
No Moving Parts
Sold and installed by
PORTLAND GAS & COKE CO.
Sixth & Salmon

## Ads in Art Moderne Dress

***By O. B. Server***

IT'S nothing astounding to find the Gas company in Portland, Oregon, leading out in advertising.

The company is known for its aggressiveness along all lines, and now that advertising has entered into a new sphere and moved up into the realm of art, it is interesting to see a Gas utility become the leader. One might expect this from a jeweler or furrier, but as a usual thing the gasman does not possess sufficient pride in his product, to attempt to soar above his fellowmen.

One of the most striking and talked-of ads recently published on the Pacific Coast was the shadow picture of a coal scuttle with Gasco Briquets.

The message itself is short and caught at a glance, which is the desirderatum of good newspaper advertisements.

The very striking Gas refrigerator ad "New York Goes Electrolux" made a hit with the builders and immediately resulted in sales which did not have to be traced to the advertisements, because the builders volunteered the information.

### Announce Plans for Construction of Modern Gas Plant

The Central States Electric Company, Iowa Falls, Ia., operating the gas plant and distribution system, has announced plans for construction of a new and modern plant to handle its increasing business. Work will be started soon upon the project, it is stated.

# When A Gas Company Is Bound To Enlarge Its Service

## A Review of Recent Decisions on the Subject of Extension of Gas Service

*By Leo T. Parker*

FREQUENTLY, it has been held that it is the duty of the city authorities to determine when it is required for public necessity or benefits to extend gas mains. However, whether or not a gas company can be compelled to extend its mains depends upon the expense involved and the financial returns which will result immediately and in the future from making the extension. Obviously, a Public Service Commission may rightfully disagree with the municipal authorities if the need for the extension is not apparent or the expense of extending the service exceeds an amount upon which justifiable and reasonable revenue may be earned.

On the other hand, it is important to know that the fact that the *immediate* return on the investment is not adequate is not sufficient reason for a gas company to refuse to make the extension and supply gas to inhabitants in a newly and sparsely settled community, if the evidence indicates that the population of the community is likely to rapidly increase. This point of the law was considered by the Supreme Court of the United States in the leading case of New York *v.* New York Gas Co., 245 U. S. 345. Here it was disclosed that the Public Service Commission ordered the gas company to extend its distributing system to a community which was situated 1½ miles beyond the then installed mains.

### Tenants Likely to Use Gas

The community was a rapidly growing settlement of 330 houses, of an average cost of $7,500, thus giving assurance that the occupiers of them would be probable users of gas, and which, with very few exceptions, were occupied by families the entire year.

The length of the extension ordered by the commission was about 1½ miles but the mains of the company were being used to almost their full capacity, and for this reason the estimated cost of making the improvement included new mains of some 8 miles in length. The engineer of the gas company testified that the cost of the ordered extension would be approximately $86,000, while the engineer for the Public Service Commission estimated the cost at $61,000. On the basis of the company's estimate of the cost of the extension the income would be about 2¼ per cent, per annum ,and, on the basis of the estimate by the commission the income would be 4 per cent.

The gas company contested the decision of the Public Service Commission, and appealed to the Supreme Court of the United States on the grounds that the order deprived it of its property without due process of law and denied to it the equal protection of the laws, in violation of the Fourteenth Amendment to the Constitution of the United States, in requiring it to extend its distributing system which involved an expenditure of money upon which the prospective earnings would not provide an adequate return on the basis of 2¼ per cent. However, since the evidence tended to prove that the population of the community soon would increase to afford a fair return on the investment, the Supreme Court upheld the Commission's order, saying:

### May Not Pick and Choose

"Corporations which devote their property to a public use may not pick and choose, serving only the portions of the territory covered by their franchises which are presently profitable for them to serve and restricting the development of the remaining portions by leaving their inhabitants in discomfort without the service which they alone can render . . . Under conditions . . . the initial return upon the investment involved would be low but with every prospect of its soon becoming ample, and also that no claim was made by the company that the comparatively small loss which the company claims would result would render its business as a whole unprofitable."

Moreover, it is well established that the fact that the inhabitants have other efficient means of obtaining light and heat is not sufficient reason to justify a gas company in refusing to extend its mains.

For illustration, in New York & Queens Gas Co. *v.* McCall, 113 N. E. 795, an order of the Public Service Commission required a gas company to extend its mains to serve a community of about 332 houses, already supplied with electricity and which could have no gas unless supplied by the company. The estimated cost of the extension was $60,000 with evidence to show that the increased return on this investment would be approximately $1,660. The Commission ordered the extension, but the lower Court reversed the order because the inhabitants were supplied with electricity and the gas pipe line must be constructed under a navigable stream. However, the higher Court reversed the lower Court's decision, and upheld the Commissioner's order, saying:

"The occupants of these houses can get no gas unless they are supplied by the relator. It is the duty of the relator to supply their needs if practicable . . . The question now is whether or not there was any evidence to show that the order of the Public Service Commission was an unlawful and arbitrary exercise of power . . . The lower Court said that the cost of the extension would be between $60,000 and $70,000, and that the increased return to the relator from the consumption of gas would be about $1,660 per year, which is only one-half of the interest at five per cent upon the extension. This is very far from showing that the order of the Public Service Commission was simply an arbitrary and capricious exercise of power."

### Provisions of Franchise Effects Extension Order

Obviously, if the franchise, under which the gas company is operating, contains provisions giving municipal officials authority to order or approve extensions, generally, their order is valid, unless the evidence shows that the order for extension of service is unreasonable.

For instance, in Oklahoma Gas Co. *v.* State, 209 Pac. 777, it was disclosed that a gas company was operating under a franchise which provided that the mayor and council "shall at all times have power to impose all needful and reasonable regulations for the protection of the interest of the inhabitants of the city, and shall have the power after full hearing to require extensions of service where it can be done without financial loss to the gas company.

The mayor and council ordered the gas company to extend its mains and service in a locality having but sixteen dwellings with a total of seventy-one rooms. The extension required about 1,740 feet of pipe and the initial cost of laying the pipe approximated $2,000. The annual revenue expected from supplying the residences served by this extension was $497.

The gas company contended that the order was not reasonable in consideration of the fact that the net income from the extension would amount to only $81.52, without any deduction for depreciation or interest.

However, since the testimony proved that the community certainly would substantially increase in population and, also, because the franchise delegated power to the mayor and council to authorize extensions of the service, the higher Court upheld the validity of the extension order, saying:

"It is not claimed that this extension will entail an actual loss, but, to the contrary, it will yield a return on the investment of about 4 per cent. per annum. It may be conceded that this return is inadequate, but this alone will not suffice to render the order legally unreasonable. The appellant may not choose to serve only those portions of the city which are presently profitable to it and restrict the development of the remaining portions by leaving the inhabitants thereof in discom-

fort without the service which it alone can render."

### Gas Company Not Required To Extend System

On the other hand, where the extension is unreasonable, it has been held that it should not be ordered. Thus in Boulevard Heights Corp. *v.* Rochester Gas Corp. (1922: N. Y.), the Public Utilities Commission held that a gas company will not be ordered to extend its service into a real estate tract where there are no customers to be served, and consequently, no immediate return on the investment. The Commission said:

"The power given the commission is to order reasonable extensions. It is discretionary power which should be exercised wisely and cannot be arbitrarily used . . . The extensions requested would be in the interest of petitioner (real estate owner) and to its advantage in the sale of lots. It is unquestionably the duty of a public service corporation to meet and anticipate the development of the territory in which it exercises its franchise. It would, however, be an unwarranted exercise of the discretionary power vested in the commission to require a public utility to invest its money in the extension of mains where there are no premises to be served . . . It would establish a precedent for extensions into territory where no present need of service exists, and would involve the expenditure of capital by public utilities upon which, in all fairness, they should be entitled to a return, which could only be obtained at the expense of present consumers in the rates charged for commodities."

#### Income Must Justify Extension

Also, in the leading case of Root *v.* New Britain Gas Light Co., 99 Atl. 559, the Court held that where it does not appear that the initial income to be derived from the expenditure of extending gas mains will not net a reasonable income, the extension need not be made unless the testimony indicates conclusively that the population of the new community will increase sufficiently to justify the expenditure.

In this case the higher Court reversed the lower Court's decision which upheld the Commission's order, and said:

"In the present case the facts appearing upon the record make it quite clear that under existing conditions there would be small prospects of a sufficient income from the extended service to fairly compensate for its cost. As to future prospects, however, the record is not so informing . . . Without more definite information than is thus furnished we do not think that the Court was in a position to pass upon the question of whether or not the commission was justified in making its order . . . Of course, a public service corporation should not be required to give an enlarged service at a considerable cost where the prospects of return for many years to come are so meager as to be out of all proportion to that cost."

In still another recent and leading case of Greenwood *v.* Provind, 108 So. 284, the owner of property in a new subdivision instituted legal proceedings to compel a municipality to extend its mains 700 feet to the newly constructed houses in the subdivision. Since the testimony did not indicate that the present nor the anticipated future return on the investment justified the expenditure of money necessary to install the extension the Court held the company not required to extend its mains, saying:

"Certainly it is the law that a resident of a municipality, living in a remote corner thereof, may not compel the city authorities to extend its mains to his premises regardless of the cost, and expense to the city, merely because the citizen resides within the boundaries of the municipality. The extension of the system from one part of the city where already laid to another part depends upon the reasonableness of such extension, considering the demand for it, the number of subscribers, and the revenue to be obtained."

### Insolvent Gas Company Not Required to Make Extension

It is important to know that if the evidence shows that a gas company is insolvent or not financially able to bear the expenses of extending its lines, the Courts consider this fact in rendering its decision.

For illustration, in Fidelity Co. *v.* Kansas Natural Gas Co., 219 F. 614, it was disclosed that a Public Utilities Commission ordered a gas company to extend its mains. The estimated expense involved was $300,000. Evidence was introduced proving that the gas company was in the hands of a receiver and that the rate suggested by the Commission would not net a fair return on the total investment. In view of these facts the Court reversed the Commission's order and in holding the gas company not required to extend its service, said:

"The order made by the Commission amounts to the taking of property for public use, and the question of just compensation at once arises. The Commission, acting within its jurisdiction, has limited the rates to be charged for gas by the receivers. It is claimed by those receivers that the rates as so limited produce no just return on the property involved, and are confiscatory."

### Real Estate Company Not Entitled to Recover Value of Mains

Frequently real estate companies install at their own expense, mains in new subdivisions and later, when the municipality incorporates the subdivision within its corporate limits, the real estate developers endeavor to collect from the city the expenditures made in installing the mains.

For example, in Ford Realty Co. *v.* City, 164 N. E. 62, a realty company filed suit against a city to recover $16,644 which the real estate company paid for installing mains in the streets of a village.

The contract between the village and the realty company provided that the latter should put these mains in and make all connections without any expense of any sort or kind to the village, although the title to the equipment installed by the realty Company was to remain with the latter. Subsequently, the village was incorporated as part of the city and the realty company contended that the city was obligated to pay for the equipment because the original contract for installation was between the village and the realty company and the agreement provided that the title to these pipes should always remain in the realty company.

However, the Court held the city not required to pay for the pipes and other equipment installed by the realty company, saying:

"The pipes that were laid by the Ford Realty & Construction Company were for the purpose of enhancing the value of their own allotment, and, undoubtedly, the enhanced value of the lots was charged against the property owners who purchased lots in this allotment, who probably would not have purchased them but for the installation of the pipes.

### Power of Public Utilities Commission

Generally speaking, the Courts are adverse to reversing a decision rendered by a Public Utilities Commission, unless it is shown that such order is unreasonable, confiscatory or discriminatory.

The Public Service Commissions were created to perform very important functions, namely, to regulate the great public service corporations in the conduct of their business and compel those corporations adequately to discharge their duties to the public and not to exact therefor excessive charges. Conversely, the commissions are expected by the law to approve rates and expenditures which will result reasonably profitable to the Utilities Commissions.

It was assumed by the Legislatures that the members of the Public Service Commissions would acquire special knowledge of the matters intrusted to them by experience and study, and that their decisions would prove efficient instrumentalities for dealing with the complex problems presented by the activities of Public Utilities Corporations.

In Woodhaven Gaslight Co. *v.* Nixon, 196 N. Y. S. 623, the Court refused to reverse a commission's order that a gas company extend its mains, because no testimony was given which proved that the order was unreasonable. This Court stated the following important law:

"It was not intended that the Court should interfere with the commission or review their determinations further than is necessary to keep them within the law and protect the constitutional rights of the corporations over which they were given control."

### Limitation of Commission's Authority

Another important point of the established law is that a Public Utilities Commission cannot compel a gas company to extend its mains in territory or render service to communities which the company has not expressly or impliedly agreed to serve. This point of the law was involved in the case of Oklahoma Natural Gas Co. *v.* Corporation Commission, 211 Pac. 401.

The facts disclose that the Oklahoma Natural Gas Company was a public service corporation engaged in the business of furnishing natural gas to between 35 and 40 cities and towns in the state of Oklahoma. It owned the franchises in about 30 of these cities and towns. Also, it furnished gas for distribution by other companies and owned a gas pipe line extending from its fields southward in close proximity to a town named Chickasha. The Chickasha Gas Company was a public utility engaged in the business of manufacturing and distributing artificial gas in the city of Chickasha and, on authority of the Commission, it extended its pipe lines to the Oklahoma Gas Company's pipe line, after which the Commission order the latter company to supply gas to the Chickasha Gas Company so that the latter may serve the inhabitants of Chickasha. However, it is interesting to observe that the Court refused to uphold the Commission's order, saying:

"The appellant (Oklahoma as Company) has never professed or undertaken to furnish gas to cities and towns or communities indiscriminately. It serves approximately 40 cities and towns in the state, all of which it has served for years, and to these it owes the public duty of continuing the service . . . The appellant has never supplied the Chickasha Gas Company with gas and has never undertaken or agreed to do so . . . The authorities are harmonious in holding that one enters the public business by professing or undertaking to serve the public, and that his public obligation is limited by the extent of his profession . . . The fact that it is a public utility does not necessarily cast upon it the duty of serving the public at large. This duty is not to all men, but to a certain public utility limited by its profession. . . While the appellant is employing its resources and property in a public service, it must be remembered that these still remain its private property, and that the public cannot assume the rôle of general manager, and require such property to be used in a service to which the owner has not voluntarily dedicated it."

### When Cancelled Check Is Proof of Payment

It is important to know that cancelled checks are deemed competent evidence only when the other party in the litigation fails to object to their being offered as testimony.

For illustration, in Barrick v. Pratt, 32 F. (2d) 732, it was disclosed that two persons organized a gas company. Controversy developed when one of the partners named Pratt contended that he had not received, out of the profits, the payment of $57,000 in money which he advanced during the organization and operation of the plant.

At the trial Pratt introduced as evidence many cancelled checks to sustain his contentions that he had advanced the money. The other partner did not object to Pratt submitting the checks as evidence and judgment was rendered by the lower Court in favor of Pratt.

The other partner appealed to the higher Court to reverse the verdict on the grounds that no evidence was submitted proving that the cancelled checks represented money used in the organization and operation of the plant. However, the higher Court refused to reverse the verdict, saying:

"It is argued that the trial Court erred in accepting Pratt's testimony and his cancelled checks as sufficient evidence of the advances made by him in the operation of the gas plant. In support of this argument it is said that the books of the gas company ought to furnish the best evidence that those advances were made. It is to be observed that the books of the gas company were available. . . . It was competent for Pratt to show by his own testimony and by his cancelled checks the advances that he had in fact made. Such evidence did not presuppose the existence of better evidence. A party cannot sit idly by and permit competent evidence to be admitted without objection, and then insist that it was possible for his adversary to prove his case by other and more conclusive evidence."

### Gas Company Liable for Laying Pipe Line Through Cemetery

Generally speaking, a cemetery is created by any act on the part of a municipality or an individual by appropriating a particular plot of land for this purpose. It is not necessary in the appropriation of land for cemetery purposes that the land be platted and laid out in lots. The fact that a plot of land is *used* for cemetery purposes is sufficient to constitute a legal creation of a cemetery.

The law is well established that the acceptance of such dedication gives the right of the living to place monuments or suitable decorations over the graves of their dead as memorials, and to preserve and beautify the premises if they so desire. However, under all circumstances a cemetery remains a legal burying place until it has been permanently appropriated to a use or uses entirely inconsistent with its purpose as a cemetery, or where it has been so neglected as to lose its identity as such *by the public*. The fact that weeds are permitted to grow or no markers are at the graves does not indicate conclusively that it is abandoned.

For instance, in Magnolia Gas Co. v. Leach, 17 S. W. (2d) 471, it was disclosed that a gas company, in the construction of its pipe line, ran over a tract of land on which a graveyard was located. In digging the ditch for the pipe line a grave was blown up and destroyed, which contained the deceased daughter of a mother living in the community. The mother sued the gas company for $1,100 as actual damages and $850 as exemplary damages.

The gas company defended the suit mainly upon the ground that the graveyard had been neglected and was so overgrown with briars and other vegetation that graves could not be discerned, and that if the grave of the daughter was destroyed, the company's employes did not discover the grave and did not know that it was located in the line of their right of way before the ditch was constructed.

Notwithstanding this argument, the Court held the gas company liable, saying:

"Was it negligence on the part of said defendant's (gas company's) servants, in the construction of its pipe line, to construct same through the premises in question? The jury further found that such negligence was the proximate cause of the destruction of the grave."

### Well Casing Held Personal Property

Generally speaking, any thing, machine or merchandise which is permanently attached to real property becomes a part of it and cannot be removed without consent of the owner of the land. However, it is a well recognized fact that a land owner may agree that a thing, which is permanently attached to the realty, shall remain personal property and, therefore, it is removable from the land.

For example, in Wagner Supply Co. v. Bateman, 18 S. W. (2d) 1052, it was disclosed that the owner of land contracted to purchase well casing with the understanding that the seller should retain a chattel mortgage on the casing until it was fully paid for. A well driller, who was not paid for his work, filed a mechanic's lien on the land and attempted to prevent the seller of the casing from removing it from the land on the contention that it was permanently attached to the realty. However, the Court held the seller's chattel mortgage superior to the mechanic's lien, saying:

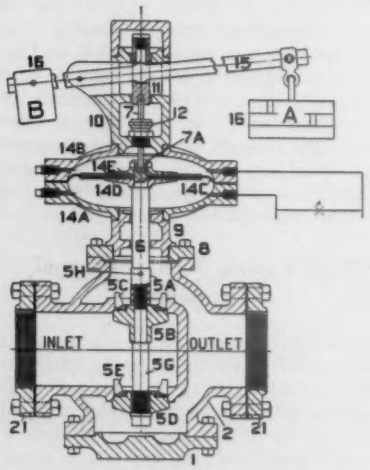
"To say that the chattel mortgage ceased to be effective because the property described in the mortgage and embraced in its specific and general terms became a part of the realty, or of the lease or well, and no longer subject to the terms of the chattel mortgage. However, we do not think it became a part of the realty or of the lease or of the well, or appurtenant thereto, under circumstances which defeat the mortgage lien. It is clear from the mortgage itself that the contracting parties intended that it should remain personalty and be subject at all times to the mortgage lien."

# Equipment News

### Barco Lubricating Plug Valves for Gas, Oil and Tar

The Barco Manufacturing C.o, 1801 Winnemac Ave., Chicago, Ill., make a line of Lubricated Plug Valves for air, gas, oil and tar. A cross section of a valve is shown. The advantages claimed for these valves is full direct port opening with one-quarter turn of the handle or wrench.

The fit between the plug and body is perfect so that the lubricant is not relied upon to make a tight seat, but to prevent wear and make valve work easily.




*High Pressure Regulator*

Barco Lubricated Plug Valves are available in all types and sizes, of metals best suited for the service required, and are furnished for high pressures and temperatures as well as low pressures, temperatures and vacuums.

The Barco Company has also issued a bulletin describing their line of Flexible Ball Joints, which are specially adapted for use in gas plant lines.

Copies of Bulletins will be mailed on request.

### Beaver Grooving Tools for "Victaulic" Joints

The Borden Company, Warren, Ohio, have recently developed and put on the market grooving tools for "Victaulic" joints.

The exclusive patented feature is that the Beaver Grooving Tools (2" and up), lock on the pipe by means of an internal chuck—and the cutting knives cut a groove that is perfectly circular—regardless of the fact that the pipe itself may be out-of-round.

This point is of extreme importance since very few lengths of pipe, particularly the larger sizes, are perfectly circular, and any tool made to follow the periphery of the pipe will cut a groove that will conform to its contour—and to whatever degree the pipe end is out-of-round, there will be that much misfit between the groove and the coupling itself.

The highest quality of workmanship obtains in Beaver products—and the experience of more than thirty years in the manufacture of pipe tools is in itself a guarantee of satisfactory performance.

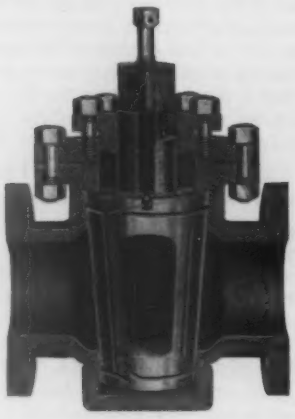
Every Beaver tool of any type is unconditionally guaranteed to give satisfactory performance to the user.

These tools come in a number of sizes for pipe of ½ inch to 16 inches and are made for hand or power operation. Further details on request.

### New Fulton Differential Regulators

The Chaplin-Fulton Mfg. Co., Pittsburgh, Pa., have recently brought out two differential regulators which should be of particular interest to gas companies which are confronted with problems having to do with mixing natural and manufactured gas. Usually a fairly constant pressure ratio exists between the natural and manufactured gas for a definite heating value and these regulators are designed to maintain this ratio or differential.

In their printed matter they state that "for high pressures the Fulton Differential Regulator is recommended, while for lower pressures the Fulton Weighted Illuminating Regulator is advocated. The former has a hard seated valve and the latter a soft seat."



The Fulton Weighted Illuminating Regulator which is shown in sectional view is stated to be practically frictionless, sensitive and designed to maintain a perfectly uniform pressure throughout the entire range.

When used as a mixing gas regulator, it will be noted that the valve opens downward and the under side of the diaphragm should be connected to the outlet side of the regulator and the upper side of the diaphragm to the other gas line over which it is desired to maintain a constant differential pressure. It is then the duty of weight "B" to balance the weight of the moving parts and weight "A" to maintain the desired differential pressure. Both weights are adjustable and the same general directions

*Weighted Regulator*

should be followed in putting this regulator in service as applies to the Weighted Illuminating Regulator.

### Bryan Copper Tube Boiler

Bryan Steam Corporation, Peru, Indiana, have recently brought out a gas-fired house heating boiler for which certain important and interesting claims are made. These are included in the following description.

Through its copper tube assembly nested in baffle form at a right angle to the heat, the Bryan Boiler permits the water to absorb the heat almost instantaneously. The major water supply is located above the fire and the exhaust gas vents pass through the water and steam in the dome, thus permitting a further absorption of the heat units, the drying of the steam, and further heating of the water on its way into the flow lines. In the case of steam, this results in less condensate going into the flow lines, thus giving a dry heat and causing less return water.

The water and steam dome at the top of the boiler, together with the boiler ends, lower water rings and tubes, carry several times the amount of water necessary to generate their rated capacity.

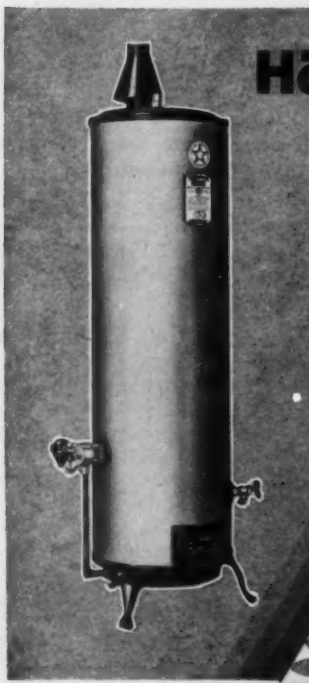
The water is carried from the dome to the lower water ring by the two boiler ends. The tubes are supplied from the lower water ring as the water is forced by circulation up through the tubes and into the dome, where the water falls back, and the steam goes into radiation.

The burner used in the Bryan Gas-Fired Boiler is made under the "Barber" patent, and is entirely free from the back-firing. A positive gas pressure regulator is assembled in the main burner line. A labeled hand-shut-off valve is furnished to cut off gas at the burner when desired. The secondary air control of Bryan design, closes the draft when the burner is out, thus preventing rapid cooling of the boiler, and automatically opens when the burner resumes operation.

*(Continued on page 68)*

# "SKIRTS WILL BE LONGER THIS WINTER"..

**Just as Poiret, Chanel, Lelong and other master designers of women's wear have established an international reputation for setting the style with their originality and flair for what is exactly right in the mode of the minute, *so Welsbach stands as the international authority on what is right in the field of gas appliances.***




**As a buyer, you must consider appearance, efficiency, construction and price of radiant room heaters and water heaters. On these fundamentals, Welsbach, an original investigator, a leading manufacturer for over forty years, has maintained its position of authority by ceaseless effort and activity. The name Welsbach on these important appliances is a guarantee of their essential *rightness* from every viewpoint. That this is appreciated is shown by the fact that Welsbach room heaters and water heaters hold their old friends year after year and add new ones continually. Welsbach Company, Gloucester City, N. J.**

***Member American Gas Association***

**Welsbach**

## Bryan Boiler

*(Continued from page 66)*

The safety pilot control is so designed that the main gas valve is automatically closed if the pilot light should in any way be extinguished. A boiler-pressure control and low water cut-out provide protection against damage from low water.

The copper tube sections used in the boiler's construction are primarily responsible for the quicker heat and greater fuel economy obtained. The flexibility of the copper tube sections permits them to be brought directly in contact with the fire without danger of cracks or rupture from sudden expansion or contraction, as in the case of the cast iron sections of ordinary boilers. The greater heat conductivity of copper permits almost instantaneous transmission of heat, and prevents all possibility of burning or overheating, as long as the inner surface of the tube is covered with water.

The Bryan Copper Tube Boiler is constructed strictly in accordance with the code established by the American Society of Mechanical Engineers, as applied to low-pressure boilers and is so stamped. It has also been approved by the A. G. A. Testing Laboratory.

Further details will be sent upon request.

## Prest-O-Weld Two-Stage Oxygen Regulator

The Oxweld Acetylene Company, 30 East 42nd Street, New York City has added to the Prest-O-Weld line a two-stage oxygen regulator, designed to eliminate fluctuation in working oxygen pressures. This regulator, which is designated the type R-109, incorporates the stem-type valves, which have proved extremely satisfactory in single-stage regulators.

The chief feature of the improved design is two-stage pressure reduction, accomplished through the medium of two independent sets of diaphragms, valves and springs. Instead of reducing the full cylinder pressure of about 2000 lb. per sq. in. down to working pressure, which is often only a few lb. per sq. in., in one-stage, the R-109 regulator reduces through this wide range in two stages. In the first stage the cylinder pressure is reduced through a non-adjustable reducing valve to about 175 lb. per sq. in. Leaving the first stage the oxygen passes to a second valve and diaphragm assembly, where the pressure is reduced to that desired by the operator, the second-stage reducing valve being adjustable by means of the hand wheel. Thus, instead of reducing the full cylinder pressure to working pressure, the second stage is required to regulate pressures within only a narrow range.

When the pressure in the cylinder falls below about 175 lb. per sq. in., the first-stage valve remains fully open. It is thus automatically cut out of the system and the second-stage valve and diaphragm only are operative. The type R-109 regulator will operate with equal efficiency whether the oxygen cylinder is full or nearly empty, and the working pressure will remain constant.

Trouble sometimes experienced in the past from opening cylinder valves with the adjusting screw of the oxygen-regulator turned in, thus permitting the full cylinder pressure to enter the low-pressure gauge and rupture the Bourdon tube or damage the valve stem of seat, has been largely eliminated in this regulator since it is impossible for the full cylinder pressure to enter the low-pressure gauge. The first-stage valve is of such sturdy design that it will withstand the most severe impact likely to occur.

The type R-109 oxygen regulator supersedes the type R-105. It is provided with 3000-lb. and 100-lb. gauges, and is equipped with a ¼-in. ferrule hose connection.

*Get back of this*

# Book Review

## Mechanical Equipment of Buildings, Vol. I, Heating and Ventilation.

By *Louis Allen Harding and Arthur Cutts Willard.*

John Wiley & Sons, Inc., New York. 1929. 963 pages. Price, $10

Heating problems are the backbone of industrial sales and large-scale household gas application. Every man, from the youngest salesman to the head of the department, should acquaint himself with fundamentals of heating, with the problems of competing fuels, and with the types of heating equipment that are in widest present use. This volume, in its second edition affords a splendid text for this purpose. It is one that could profitably be studied by gas men and it is an excellent, well arranged, clear reference text. It is a book that can be cordially recommended for a place in the library of the sales department of every gas company that cares to know what it is doing.

## Steam and Gas Engineering.

By *Thomas E. Butterfield.*

D. Van Nostrand Company, Inc., New York. 1929. 481 pages. Price, $4.50.

Oftentimes it is the simplest fundamental fact that is needed in studying a complex gas problem. Although these problems do not ordinarily extend to power development and power application, there are many instances in which the questions of boilers and furnaces, engines and turbines, and like equipment are involved. The present volume is announced by its authors as "an introductory text for engineering students and for engineers" and as "concerned with the utilization of fuels for the development of power." Within this range it is a splendid text. The authors exhibit sound pedagogical method in their presentation of the material and the volume is excellently illustrated and well prepared to serve those who occasionally want general or elementary information on steam and gas engineering for power development.

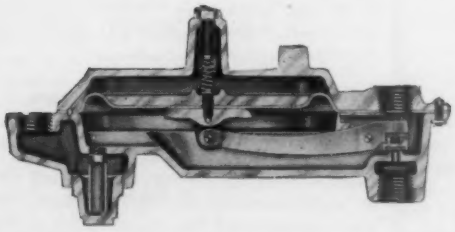
## New Publication of the West Virginia Geological Survey

*Detailed Report on Pocahontas County;* 531 pp. + xxiv pp. of introductory matter (cloth), by *Paul H. Price,* Assistant Geologist; illustrated with 71 half-tone plates and 22 zinc etchings in the text, accompanied by a separate case of topographic and geologic maps, on scale of 1:62,500, or approximately 1 mile to the inch; geologic structure in western part of county shown by structure contours on Sewell Coal and in eastern part by graphic cross-sections; text contains historical and industrial data, physiographic and stratigraphic descriptions and discussion of minerals including, coal, oil, gas, mineral water, limestone, iron ore, clay, building stone, etc.; marine fossil collections, identified by Dr. John L. Tilton, Paleontologist, with comment but without illustrations. Issued under date of June 17, 1929. Price, $3.00. Extra copies of topographic map, 75 cents; of the geologic map, $1.00. Remittance should be made payable to West Virginia Geological Survey, Box 879, Morgantown, W. Va.

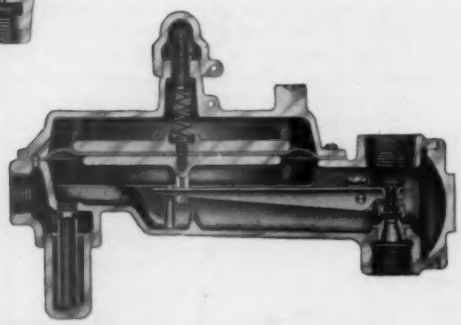
Complete list of publications will be mailed on request and names will be put on permanent address list for future publication notices if desired.

MORE and more Gas Engineers standardize on REYNOLDS Three Service Regulators—because of their flexibility in meeting all varying requirements. These three regulators, each in its respective field, give unequalled performance for successful gas control regulation. Their features—Accessibility, Simplicity of Construction and Interchangeable Parts—make them efficient and economic factors in first cost and upkeep.

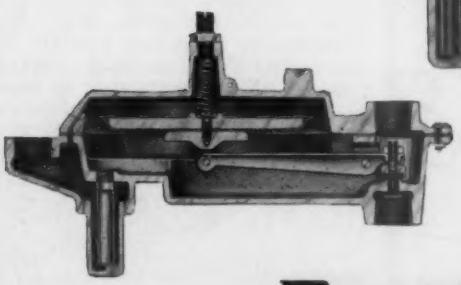
Complete details on Reynolds Service Regulators will be sent on request.



MODEL O
(Left)
Spring Type Only
With or Without Mercury
Seal



MODEL 10
(Right)
Dead Weight or Spring Type
With or Without Mercury
Seal



MODEL 20
(Left)
Dead Weight or Spring Type
With or Without Mercury
Seal

**Reynolds**
**Gas Regulator Company**
**Anderson, Indiana**

«REPRESENTATIVES»
Eastern Service Company, Boston, Mass.
F. E. Newberry, Avon, N. J.
Thos. C. Corin, Detroit, Michigan
Branch Office, 216 Dwight Bldg., Kansas City, Missouri

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

**REYNOLDS PRODUCTS**

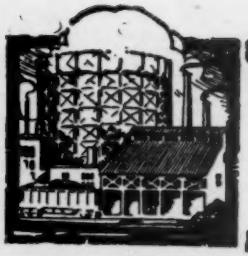
for all kinds of Pressure Reductions—for either artificial or natural gas.

GOVERNORS—
Intermediate Pressure
Triplet Outlet
Holder
Toggle Type Street

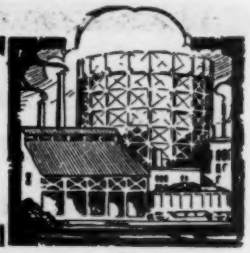
REGULATORS—
High Pressure Service
Low Pressure Service
Intermediate Pressure
High Pressure Line
Single and Double
District Station

VALVE—
Automatic Quick-Closing Anti-Vacuum

SEALS—
Mercury
Dead Weight



# NEWS OF THE GAS INDUSTRY



### Standard Gas & Electric Co. Plan Extensive Construction Work

Standard Gas and Electric Company plans to invest in excess of $63,700,000 during 1930 in new construction, additions and extensions in plants and equipment throughout the company's system, according to a statement made recently by John J. O'Brien, president of the company. Projects now in progress and construction plans for next year will not be curtailed as a result of the recent disturbances in the stock market, Mr. O'Brien stated emphatically. The Standard Gas and Electric Company system, which comprises the Byllesby operated utility companies extending over 20 states, serves 1,500 cities and towns having a combined population of 6,100,000.

"This figure of $63,700,000," Mr. O'Brien points out, "is somewhat lower than the actual construction figure for 1929, including the carryovers or incompleted construction from the preceding year. The total construction budget of these companies for 1929 amounted to approximately $66,100,000, which included carryovers of $16,800,000. The construction budget of $63,700,000 for the calendar year 1930 will include carryovers from 1929 estimated at only $13,000,000. These budget figures are based upon the best estimates we have been able to make of future conditions and requirements."

This incompleted construction, together with anticipated requirements for the future, indicates the increased load and additional business which has been obtained by public utility companies in the Standard Gas and Electric system and the additional demand for construction of this nature is evidence of the steady industrial progress in communities served by Byllesby companies.

### Authority Given to Exercise Franchises

Authority has been given to the Central Hudson Gas & Electric Corporation to exercise a franchise in the town of Wappinger, Dutchess county and for the construction of a gas system in the village and town of Fishkill. The company now operates gas plants in Poughkeepsie and Beacon and it is proposed to connect these plants with the transmission main running through towns of Fishkill, Wappinger and Poughkeepsie. It will be an eight inch high pressure main, laid adjacent to the state road. Distribution in the villages will be through two and three inch steel mains.

### Convention Calendar

**February**

19-21 New England Gas Association, Hotel Statler, Boston, Mass. C. D. Williams, 41 Mount Vernon Street, Boston, Mass., executive secretary.

**March**

10-14 Oklahoma Utilities Association, Tulsa, Okla. E. F. McKay, 1020 Petroleum Building, Oklahoma City, Okla., manager.

### Committee Appointed to Test Natural Gas in Atlanta

Under a resolution introduced by Councilman W. E. Saunders, the Atlanta, Ga., City Council has ordered the appointment of a committee which will have regular tests made of the gas supplied consumers through the mains of the Atlanta Gas Light Company in order to see that the gas, which will shortly be received from the natural gas fields of Louisiana, is of the proper heating quality. Members of the committee will be Councilman Saunders, chairman; Councilman Jack Hardy and Alderman Claude L. Ashley, it has been announced.

Keep

tuberculosis away from them

BUY

CHRISTMAS SEALS

THE NATIONAL, STATE, and LOCAL TUBERCULOSIS ASSOCIATIONS of the UNITED STATES

*A worthy cause*

### Report Large Increase in Natural Gas Sales

Missouri-Kansas Pipe Line Company, through its president, Frank P. Parish, reports natural gas sales for the month of October of 400 million cubic feet. This is a record for the organization and a 200 per cent increase over the same month in 1928, when sales were 118,747,000 cubic feet. The American Pipe Line Company, a subsidiary of Cities Service, was the largest user of Missouri-Kansas gas in October, the latter organization delivering 185,000,000 cubic feet to the American Pipe Line at Kansas City.

Missouri-Kansas Pipe Line Company is a public utility and a wholsaler of natural gas in the states of Missouri, Kansas and Kentucky.

### U. G. I. Expansion Program

Electric and gas companies in the U. G I. system will spend nearly $41,000,000 for expansion of their properties during 1930, or approximately $6,500,000 more than was appropriated for this purpose in 1929, John E. Zimmermann, president of the company announced recently.

Among the companies included in the U. G. I. group and their budgets are:

Philadelphia Electric Company, $26,400,000; Philadelphia Gas Works Company, $2,000,000; Connecticut Light & Power Co., $6,000,000; Delaware Power & Light Co.,; $2,862,000; New Haven (Conn.) Gas Light Co., $606,000; Consumers Gas Co., Reading, Pa., $543,500; Luzerne County (Pa) Gas & Electric Corp.. $501,000; Manchester (N. H.) Gas Co., $452,000; Nashville (Tenn.) Gas & Heating Co., $379,000; Harrisburg (Pa.) Gas Co., $368,000; Allentown-Bethlehem (Pa.) Gas Co., $351,000; Erie County Lighting Co., $234,000; Chester County (Pa.) Light & Power Co., $76,000; Highland Gas Co., Quakertown, Pa., $74,000; Lebanon Valley Gas Co., Lebanon, Pa., $49,000; Concord (N. H.) Gas Co., $37,000; other small properties in Pennsylvania, $22,000.

### Change Of Ownership

The Associated Gas and Electric System has acquired the American Utilities Company. The latter company has subsidiaries in New York, Delaware, Pennsylvania, Arizona, New Mexico, Texas, Oklahoma, Arkansas, Louisiana, Tennessee, Missouri and Kentucky.

*(News Continued on Page 72)*

# R&E REFRACTORY CEMENTS

# PREPARED FOR YOUR GAS PLANT

## R & E ♯ 3000

You can't find a better cement for all-around service in gas plants. R & E ♯3000 air-sets to full strength; retains its bond; makes brick dislodgement impossible when "barring down;" will not crumble. Unusual adhesiveness makes ♯3000 extremely efficient for hot or cold patching. Fine texture permits extremely thin joints which, together with its excellent bond, is a further safeguard against bricks "pulling out."

♯3000 will not bloat or puff at low temperatures; does not crumble or fall when equipment is "off the line." Withstands temperatures in excess of 3000° F.

Conveniently shipped ready for use in plastic form in 100 and 500 lb. steel drums. Try a drum today.

## "Moldit"

We recommend Moldit for such work as monolithic floors, checker work and arches. It avoids delays in waiting for special tiles or brick. Just add a little fresh water and mold it into any desired shape.

Moldit "air-sets" and attains full strength without heat. It does not shrink and meets the most severe requirements of modern construction. You can use Moldit under temperatures up to 3000° F. It's easy to use, too. Add a little fresh water and pour—no ramming, no hammering—just mold it. Weighs only 100 lbs. molded. Shipped in convenient 100 lb. waterproof bags.

## "Moldit-A"

Use Moldit-A for service under temperatures between 200°F. and 2400°F. It works the same as "Moldit" and can be used for monolithic floors, standpipes, doors, etc., any place where great structural strength is essential, or desired. Like other R & E Cements, Moldit-A air-sets and gains full strength without heat. It weighs approximately 100 lbs. per cubic foot and is shipped in 100 lb. handy waterproof bags.

Order a few bags on trial today.

*—use them in your boiler room, too!*

## —for Coke Oven Plants

After repeated unusual performances in actual gas plant service, we confidently recommend our cements to every gas plant in the country. For monolithic work, use "Moldit" or "Moldit-A." For stand-pipes, use "Moldit-A". For laying up and patching, there's nothing better than ♯ 3000. Try these cements, you'll be astonished at the results.

## —for Water Gas Plants

"Barring-down" doesn't "wreck" your brickwork when you've set it up with R & E ♯ 3000. There's a perfect bond between brick and cement, a definitely high heat resistance and no crumbling at low temperatures. You can't pull brick out where ♯ 3000 has been used. We conservatively estimate that brickwork life can be extended 25% in *your* plant. A trial will convince you.

## —for Coal Gas Plants

In laying up brick and tile and for patching (any amount of area), use R & E ♯ 3000. There's no better cement for this job. It holds its bond under *all* temperature conditions and will not chip or crumble. Don't take our word for it——try it today.

## —for Your Boilers

**Those who choose R & E Refractories for gas plants, can also use R & E ♯ 3000 for boiler applications. No cost to you if you're not entirely satisfied.**

**REFRACTORY & ENGINEERING CORPORATION**

Engineering & Manufacturing Specialties in High Temperature Cements

50 Church St., New York, N. Y.

Pittsburgh Baltimore Philadelphia Chicago

# Public Utilities Submit to President Hoover Encouraging Statement of Proposed Construction Expenditures for 1930

The following combined statement of expenditures on behalf of the public utilities was presented at Washington on November 27 to President Hoover by twenty-one of the leading executives of the industry:

"The electric light and power, manufactured and natural gas, and electric railway utilities contemplate the expenditure of $1,400,000,000 during 1930 for new construction and expansion of facilities, an increase over the corresponding expenditures for 1929 of $110,000,000.

"In addition to this amount, they will spend to maintain existing properties $410,000,000.

"The American Gas Association Statistical Department estimates that expenditures for construction by the manufactured and natural gas industry of the United States in 1930 will aggregate approximately $425,000,000, an increase of about 6 per cent over the corresponding expenditures in 1929. An additional $50,000,000 will be expended to maintain existing service facilities.

"The construction estimate is based primarily upon budget provisions already formulated for 1930 by companies representing the major part of gas production and distribution in the United States. The conclusions thus indicated have been checked against the factual experience of the industry for may years, as well as against current observation and information, and have been correspondingly strengthened.

"Gas industry growth, while unspectacular, has been marked and steady for upwards of twenty years. The latter part of the period has been its time of most rapid gain. Complete statistical reports for nine months, and covering upwards of 85 per cent of the output, indicate that the total output for 1929 should be about nine per cent ahead of the 1928 total.

"Construction programs have to anticipate this growth, as well as provide for the consequences of new trends and changing conditions, such as more and more large-volume industrial use of gas; accelerated use for additional domestic purposes, including house heating; increased density of population and use where large apartment house supplant single-family dwellings. Expansion is further stimulated by the growing popular recognition of gaseous fuel advantages and by the research that develops better utilization.

"In the natural gas branch of the industry, the existence of vast known reserves, coupled with large increases in production, is making long distance transmission economically practicable to a degree not anticipated a few years ago. Development along this line will undoubtedly continue for many years.

"These and collateral facts, trends and factors have been coordinated with obvious necessities in estimating the construction requirements of the industry for 1930. The net results, as summed up in the first sentence of this statement, have been reviewed by officers of the larger gas producing and distributing companies, assembled for that purpose at A. G. A. Headquarters in New York yesterday, and have been approved as a reasonable forecast.

"The customer contacts and day-to-day experiences of the companies represented in the conference reflect no disturbing change in business conditions or trends. They suggest no reason at this time for curtailing the contemplated expenditures for the construction and extension of gas service facilities. On the contrary, it is conceivable that cheaper money, as predicted by many forecasters in economics, might accelerate construction especially on the natural gas side of the industry."

The representatives of the American Gas Association were:

Bernard J. Mullaney, president of the American Gas Association; vice-president of the Peoples Gas Light and Coke Co., Chicago, Ill.; Howard Bruce, chairman of Board, Bartlett Hayward Co., Baltimore, Md.; C. E. Paige, vice-president of the American Gas Association, vice-president, The Brooklyn Union Gas Co., Brooklyn, N. Y.; P. H. Gadsden, vice-president, The United Gas Improvement Co., Philadelphia, Pa.; George B. Cortelyou, president, Consolidated Gas Co., New York, N. Y.; Frank T. Hulswit, president, American Commonwealths Power Corp., New York, N. Y.; J. E. Zimmerman, president, The United Gas Improvement Co., Philadelphia, Pa.; A. B. Tenney, Charles H. Tenney & Co., Inc., Boston, Mass.; Alexander Forward, managing director, American Gas Association, New York, N. Y.

## Large Natural Gas Line Completed

The main natural gas transmission line from Monroe, La., to Atlanta, Ga., has been completed, and gas has been turned into it for the first time.

The pipe line, which was built by Ford, Bacon & Davis, Inc., was completed in record-breaking time. It is constructed of 22-inch and 20-inch steel pipe, and is more than 495 miles in length, exceeding in length the line from Monroe to St. Louis.

In addition to the main line, there are approximately 415 miles of lateral pipe, serving various Southern cities, and the new system is said to be the largest natural gas project ever to be constructed in this country at one time.

Although the gas has been turned into the main, it will be several weeks before it reaches Atlanta, it is stated, as the line is being tested in fifteen-mile sections, and leaks repaired as they develop.

Natural gas will reach Birmingham early in December, and will be brought into Atlanta about the first of January, on schedule time. The line cost approximately $25,000,000.

## Will Expand Its Natural Gas Service

The budget of the Public Service Company of Colorado for 1930 has been approved and it calls for the expenditure of $4,500,000 for the maintenance repairs, and enlargements of its plants.

The strides that natural gas is making in Denver will be readily understood when it is shown in the list of expenses for 1930 that gas maintenance, is alloted $500,000; an intermediary pressure system to supply large industrial concerns, $125,000; replacing small mains with larger one, $125,000 and for extensions of the pipe line to take in new territory, $100,000.

The natural gas service is entering its second winter and is doing the same excellent work.

## Columbia Gas Planning Expansion of Markets For Gas

The Board of Directors of Columbia Gas & Electric Corporation at their regular meeting recently announced that the management of Columbia System has been giving much thought and study to the subject of largely expanding the gas markets and is now planning, in addition to continuing its active development plans throughout its present large territory, to make natural gas available directly, or as an enriching element to the gas distribution companies serving many cities which have not heretofore had the advantages of natural gas.

At the special meeting of the shareholders held in Wilmington, the increase of the authorized common stock without par value of the corporation from 10,000,000 shares to 30,000,000 shares, was approved.

The Board of Directors also declared a 25 per cent. dividend on the common stock, payable in common stock on March 31, 1930, to shareholders of record at the close of business, Feb. 28, 1930. Holders of subscription receipts now outstanding, having completed their subscriptions by then, will be shareholders of record and will thereby participate in this stock dividend.

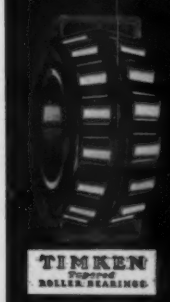
The report of the earnings of the corporation shows substantial increases over figures reported for last year, the rate of increase in the third quarter being greater than for the earlier period in the year. Net income after depreciation and fixed charges available for dividends on preferred and common stocks increased over 27 per cent. in the third quarter, as compared with 9 per cent. for the first nine months of the year, and 14 per cent. for the twelve months ending Sept. 30, 1929.

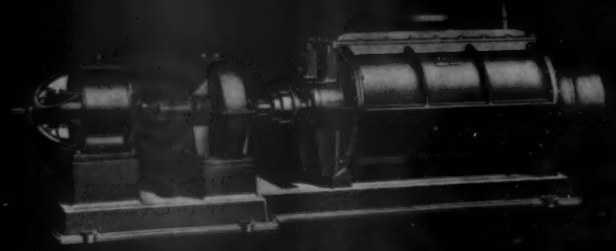
*(News Continued on Page 74)*

MACHINERY EXPOSITION OF 3029 A.D.
OBSOLETE DIVISION Nº RS-3-PUMPS

ROOTS PUMPS WON'T BE IN A SHOWCASE!

They'll be in service in the exposition hall, furnishing air for ventilating and for pneumatic carrier conveying. Buy a Roots for long service.
NOTICE - PLEASE DO NOT EXCITE YOUR ROBOTS NEAR THESE CASES -
SNAIL BLOWER VERY RARE 1929
WHIZZO BLOWER GENUINE 20TH CENTURY MODEL



"Roots Users Root for Roots"

The P.H. & F.M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

NEW YORK
120 Liberty Street

### A. B. Tunis Succeeds H. F. Weeks as Staff Member of A. G. A.

Howard F. Weeks, for the past four years editor of the A. G. A. Monthly and for several months secretary of the Publicity and Advertising Section, resigned December 1, to join the Consolidated Gas Company of New York. He will be succeeded by A. B. Tunis, secretary of the Virginia Public Utilities Association, Richmond, Va., and director of the Virginia Committee on Utility Information.

*A. B. Tunis*

Mr. Weeks joined the A. G. A. Staff in January 1926, as editor of the Monthly and assistant secretary of the Publicity and Advertising Section. Previous to this he was news editor of Gas Age-Record. In August 1929 he was made secretary of the publicity section. Mr. Weeks is also treasurer of the Public Utilities Advertising Association. He attended Brown University, Providence, R. I.

Mr. Tunis has had varied experience in editorial and publicity work. A native of Maryland, he was educated at the Norfolk, Va., Academy, and his first work was as a reporter on the Ledger-Dispatch at Norfolk. Later he became city editor of the Times-Dispatch, at Richmond; for two years was on the copy-writing staff of an advertising agency, and for five years was agent of the public relations department of the Chesapeake and Ohio railway, editing its employe magazine. Mr. Tunis has been connected with the Virginia Utilities Association since January 1928.

In commenting on this change in the personnel of the American Gas Association, Managing Director, Alexander Forward said:

"The Association loses with deep regret the services of Mr. Weeks whose faithful, painstaking and efficient work has added so greatly to the value of the A. G. A. Monthly, to our members, and to the activities of the Publicity and Advertising Section and who has won the affection and regard of headquarters staff and of the industry.

"Mr. Tunis' qualifications with a public utility association, as a magazine editor, as advertising copy writer, and a newspaper man of well-rounded experiences admirably fit him for his new work with the Association."

### Industrial Gas Demonstration in Large Department Store Window

The week ending Oct. 26th was notable in Brooklyn's shopping district. The public utilities and a number of large industrial organizations were represented in the show windows of Namm's large department store. The Brooklyn Union Gas Company placed a highly interesting demonstration of industrial gas in one of the Fulton Street windows which attracted so much attention that the police were called to keep traffic moving. The demonstration was planned by Mr. Theodore B. J. Merkt, and its chief feature consisted of a soft metal melting furnace in operation which furnished molten metal for making slush castings. Members of the New Business Maintenance Division operated the furnaces and acted as molders. The window display settings were designed and painted by Robert T. Barr, and the silhouettes were made by Chas. H. Reed. Various objects and ornaments were molded from soft clay metal melted by gas and were on display in the window.

This display was especially valuable because it brought the outstanding value and advantages of gas fuel into the public eye. Here was a miniature plant operating in a great department store's show window where fine furniture or dainty garments are ordinarily on display—and the demonstration was equally as clean and appealing. The product of this show window factory was full sized castings and ornaments of the very same size and kind that can be found in the salesrooms of such stores.

The artistic background and the cut-out figures were painted from actual scenes taken from three Brooklyn industrial plants. Use was made of color and finished metal products including aluminum foil, statuary brass and bronze, modern lamps, brass castings and bronze forgings. The raw materials included copper, brass, aluminum, zinc, german silver, solder, babbitt metal and bronze, all of which were melted and molded into beautiful products by gas. Small signs were appropriately used to inform the public of the names of the crude materials.

### New England Fuel & Transportation Co. to Increase Production with Two New Batteries of Coke Ovens

Production of gas, coke, tar and sulphate of ammonia at the Everett, Mass., plant of the New England Fuel and Transportation Company will be materially increased on July 1, 1930 when two new batteries of 41 coke ovens each, now under construction, are placed in operation.

According to Eastern Gas and Fuel Associates, parent organization of the New England Fuel and Transportation Company, the Everett plant is scheduled to produce 17,000,000 cubic feet of gas a day to July 1, 1930, at which time operation of the new ovens will increase the daily production to 22,500,000 cubic feet.

Production of gas at the Everett plant in 1930 is estimated at more than seven billion cubic feet. Production of coke is estimated at 700,000 tons. The plant during 1930 will carbonize approximately 1,000,000 tons of coal.

*(News Continued on Page 79)*

# Are You Selling Steel Boilers To Be Used with Brass Pipes

Every day we are finding hundreds of home owners astonished to find that they have invested extra money in brass piping, with a galvanized iron automatic water heater tied in at the source. No matter how beautiful the exterior, it is the inside that counts. Iron tanks will rust and wear out. Copper will last forever.

The leader in Copper Water Heaters is the KOMPAK. All Copper and Brass, with the original Automatic Pilot and Fuse Plug shut off. Sales come easily where the effort is made.

*Yours very truly,*

THE KOMPAK COMPANY,

*H. J. Long,*
*President.*

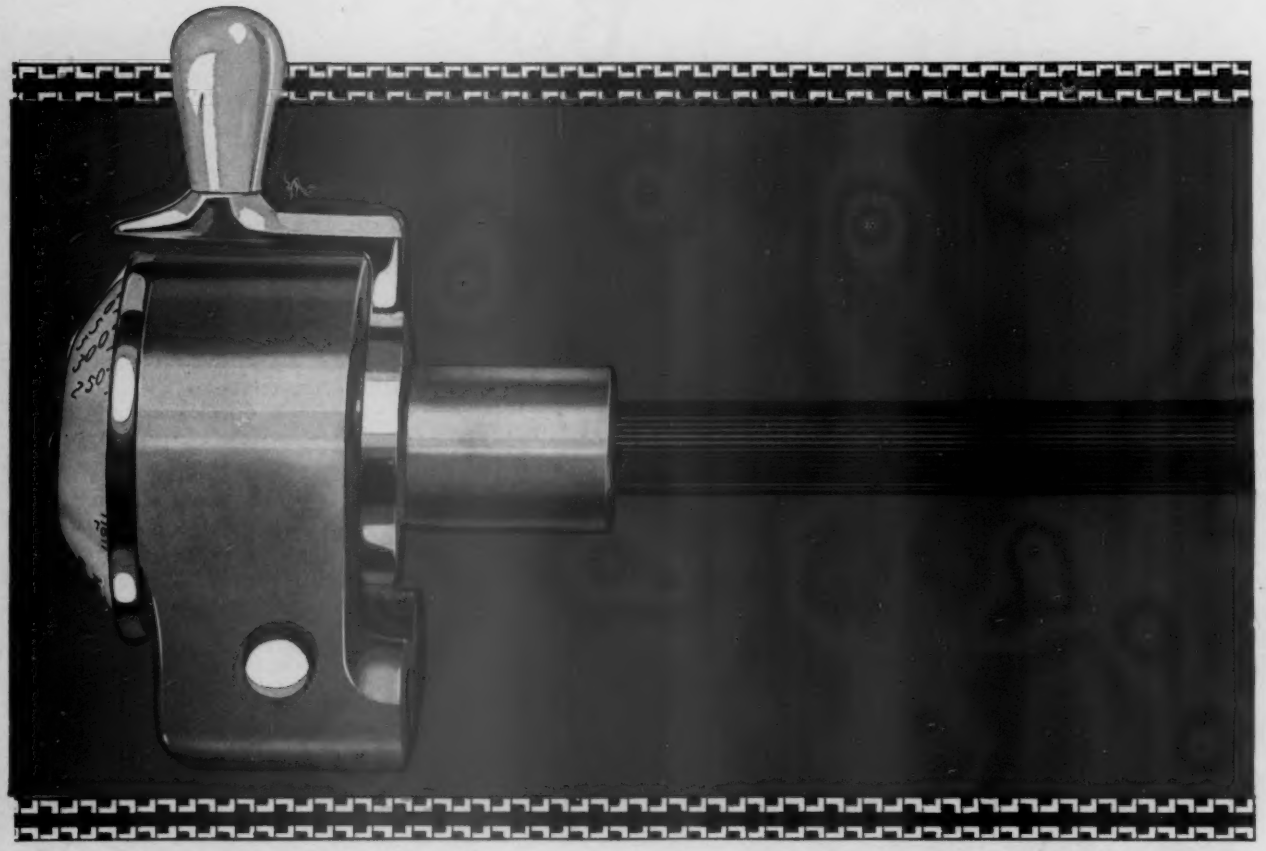
**THE KOMPAK CO.**

**Automatic Thermostatic Gas Water Heaters**

**NEW BRUNSWICK**
**NEW JERSEY**

# *The* NEW ROBERTSHAW

## *Chromium plated . . . .*
## Improved
## Absolutely fool-proof



**MORE THAN 100 of America's leading range manufacturers will include the new, improved Robertshaw AutomatiCook as standard equipment on their latest models! Hundreds of thousands of American women will want this new, finer, more handsome oven heat control on their ranges this year. And hundreds of dealers and their salesmen on the floor know that the AutomatiCook materially lowers sales resistance.**

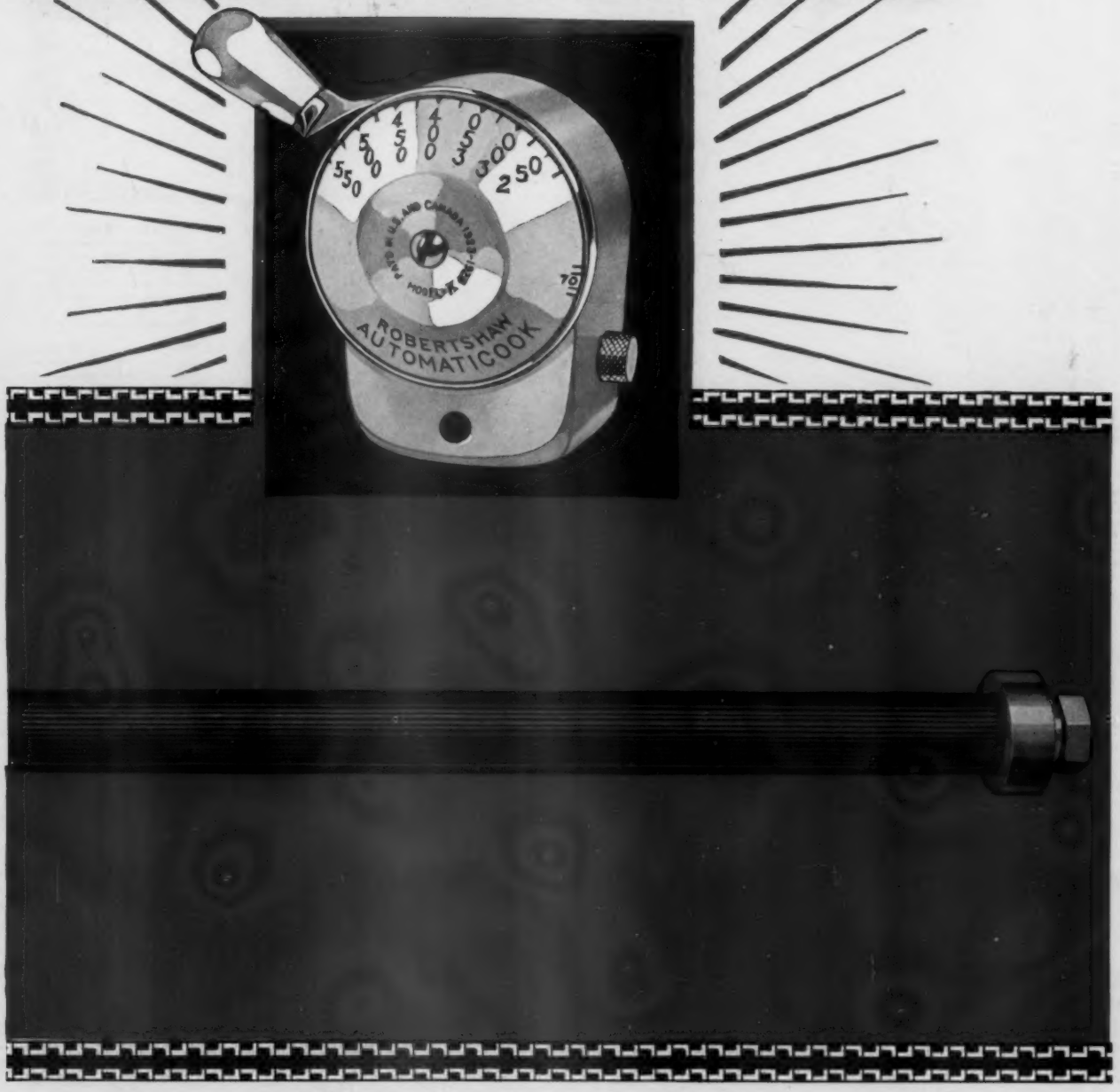
**Just look at the advantages of the new AutomatiCook! It's smaller, and more handsome. The fine chromium plate can't rust or tarnish. The dial is fully visible; the familiar white handle more easily accessible.**

**But best of all, the new AutomatiCook is equipped with a one-minute temperature check—so simple that a child can operate it!**

**Insist that the ranges you stock are equipped with the Robertshaw AutomatiCook — the oven heat control with the white handle so familiar to hundreds of thousands of American women!**

**ROBERTSHAW THERMOSTAT COMPANY**
***Youngwood, Pa.***

# AUTOMATICOOK




## WHAT IT DOES

**1** Saves more gas per year than its cost and eliminates loss of foods.

**2** Automatically maintains the correct oven temperature. Unnecessary to stay in or even near the kitchen when cooking.

**3** Eliminates guess-work and the pies, cakes, biscuits, cookies, etc., are just right every time.

**4** Assures the roasting of all kinds of meat and fowl—rare, medium, or well done—deliciously and without a single failure.

**5** Makes possible the boiling of cereals, soups and vegetables in the oven at the same time the meat is being roasted.

**6** Also the canning of fruits and tomatoes in the oven, the scientific way.

**7** And the making of all peach butter, apple butter, tomato butter, etc., in the oven. No stirring necessary.

**8** Provides for the automatic cooking of a complete meal in the oven at one time without attention.

**9** And the drying and sterilizing of dishes in the oven giving them a clean, polished surface—affording a warming closet of large capacity.

**10** Requires no experience and having no parts which can deteriorate, will operate correctly for the entire life of the range.

# ROBERTSHAW

TRADE MARK

## AutomatiCook

*Patents Pending*

1. *"Patrician"* Model shown (left) in Italian Grand Antique Marble Finish with Old Ivory Trim. Handles of Onyx Green Bakelite. Also *"Jonquil"* Model in Old Ivory with Peacock Green Trim.
2. The "Magic Chef" Oven is equipped with the famous Lorain (Red Wheel) Oven Heat Regulator.
3. Cooking-top-cover spring-balanced, easy to operate. Utensils quickly covered.
4. "Magic Chef" Oven is heavily insulated. Keeps kitchen cooler when baking.
5. Pipes, gas valves, bolts are concealed. Valves convertible by the turn of a screw into "safety" valves.
6. Unique Broiling-feature includes an extension carriage that brings broiling pan into full view for the easy turning of meats. Reversible broiling pan requires no rack.
7. Top burners of new, vertical-injection type have non-corrosive heads. Each burner can be used as a simmering or a giant burner.

# *A Pioneer Fulfills His Promise*

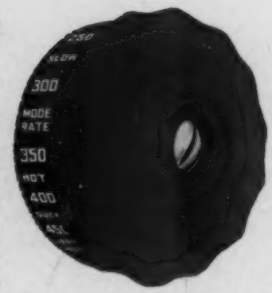
ANY industry, to move ahead, must have a leader—a pioneer. In the field of domestic gas cooking appliances this title has been fully earned by American Stove Company. And in maintaining this leadership its record of accomplishments is an enviable one.

In 1919 American Stove Company was first to announce to the world the invention of the Oven Heat Regulator, "Lorain," representing the greatest single step forward ever taken in the field of more efficient home cookery.

For more than ten years American Stove Company's program of national advertising has been the largest, most outstanding, most continuous campaign ever maintained by a gas appliance manufacturer. And now, in MAGIC CHEF, the New Vogue in Gas Ranges, American Stove Company has an achievement that no other concern or individual ever before attempted—a drastic departure in design that because of its striking beauty and matchless efficiency immediately set new standards that will be the industry's beacon lights for years to come.

MAGIC CHEF is the fulfillment of a promise made many years ago when American Stove Company announced the invention of the Lorain Oven Heat Regulator. MAGIC CHEF is, too, like the Red Wheel, an augury of newer and even more noteworthy achievements to come—achievements that will mean fully as much to the advancement and glorification of the gas industry as the Lorain Oven Heat Regulator and MAGIC CHEF.

Magic Chef



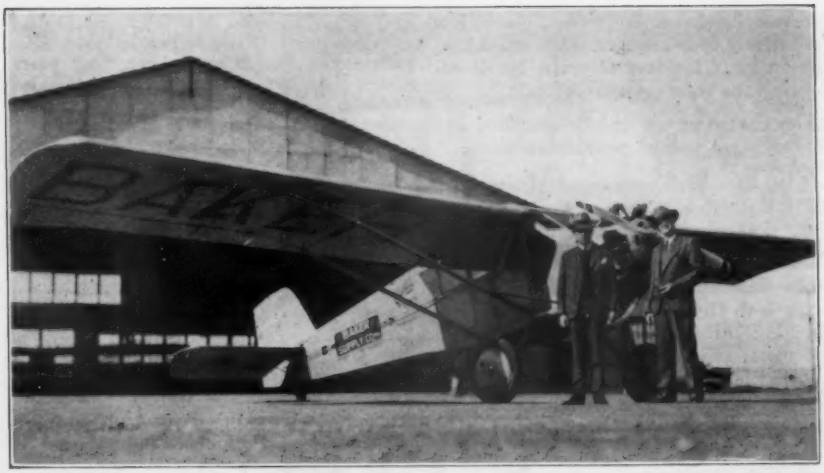

UNLESS *the Gas Range has a* RED WHEEL *it is NOT a* LORAIN

CASH PRICE

**$195.00**

*($210 West of the Rockies)*

AMERICAN STOVE COMPANY · *Dept. A, 801 Chouteau Ave., St. Louis, Mo.* · LARGEST MAKERS OF GAS RANGES IN THE WORLD




*This airplane owned by the Baker Supply Company of Cambridge, Mass., was used to transport their exhibit to the Annual Convention of the American Gas Association held in Atlantic City in October. The plane left Boston at 11:19 and arrived in Atlantic City 3:00 P. M. Harold G. Crowley, pilot, and J. A. McCarthy, Boston representative of the company are shown*

### Old Employees Honored by the Brooklyn Union Gas Company

The Brooklyn Union Gas Company at their annual dinner entertained its old employees and others whose services included some outstanding meritorious act. The four hundred and fifty guests of the gas company consisted of the employees to be honored and their immediate relatives. 88 of these employees ranged with from 25 to 55 years of continuous service. They were grouped in periods of employment separated by 5 years, there being four with 55 years service credit, one with 50 years, three with 45 years, eleven with 40 years, eleven with 35 years, 22 with 30 years and 36 with 25 years. At the close of the dinner, a formal program of presentation of emblems took place. President James H. Jourdan, Vice Presidents Clifford E. Paige and Arthur F. Staniford, as well as other officers of the company attended the dinner.

The formal program was introduced by John T. White, Assistant Secretary of the company, who acted as chairman. The address of the evening was delivered by Clifford E. Paige.

Vice President Arthur F. Staniford, himself a 48 year member of the company, presented the service emblems, consisting of an engraved gold button to each of the 88 persons with 25 years or more of service. Bartholomew F. Kotchie, 55 years service, John R. Callow, 50 years service, and Michael Leonard, 45 years, are still active workers for the company.

The presentation of McCarter Medals and Certificates to those who have saved persons from asphyxiation by gas was made by Henry E. McGowan, Secretary of the company.

The President's medals and certificates awarded by the National Safety Council for saving life were presented by Herbert Wellington, Treasurer. Mr. Wellington also presented the Brooklyn Union Gas Company's meritorious emblems for distinctive service.

The formal program closed with the presentation of the President's trophy for the company baseball championship and the President's trophy for the bowling championship by Mr. Edward Marsh.

### Franchise Signed

Members of the board of county commissioners at Terre Haute, Ind., recently signed a franchise with the Universal Gas Company of that city giving the recently formed company the right to lay gas mains from the plant of the Indiana Consumers Gas By-Products Company east to the county line.

The gas main is intended to serve a large number of towns south and east of Terre Haute. It is one of the mains which will radiate from Terre Haute in several directions and permit the enlargement of the Indiana Gas Consumers plant, which has needed an outlet for gas for a long time.

### Oakland City, Ind., Gets Natural Gas

Natural gas from the big wells near Francisco, Ind., now is available in the business section of Oakland City. The gas company is extending the lines in this city and will have gas to a majority of the homes within the next two months.

### City of Halifax, N. S., Chosen for 1930 Convention of the Canadian Gas Association

At a meeting of the Executive Committee of the Canadian Gas Association held on October 16th, 1929, it was decided to accept the invitation of the Nova Scotia Light & Power Company Limited, Halifax N. S., and that of the New Brunswick Power Company, of St. John's, N. B., that their next Convention be held in the City of Halifax, N. S., in 1930.

A recent questionnaire sent out, revealed unanimous approval of Halifax as the place of meeting for 1930.

The Committee gave some consideration as to the best time to hold the meeting, and finally decided that Tuesday and Wednesday, June 24th and 25th, 1930, would be the most suitable dates.

### Missouri-Kansas Pipe Line Co. Acquire Natural Gas and Mineral Production Rights in Kentucky

Missouri-Kansas Pipe Line Co. has acquired natural gas and mineral production rights in 50,000 acres of land in Caldwell County, Ky., Frank P. Parish, said, recently in announcing further development of western Kentucky by his company.

The Missouri-Kansas Co. is already drilling for gas in eight Kentucky counties and over an area eighty miles long and practically fifty miles in width, extending from the district around Owensboro, on the north to a point below Princeton, in Caldwell County, on the south.

Among the counties in which the Missouri-Kansas Co. is operating actively at present are Muhlenberg, Hopkins, Christian, Daviess, Webster, Henderson and Todd, while drilling is to begin in the near future in Warren and Logan Counties. In Daviess County on one lease, four wells now have an open flow of 10,000,000 cubic feet of gas per day.

Small operators in the western Kentucky district are turning their natural gas supplies over to the Missouri-Kansas Co., which is encouraging drilling by small independent companies and land owners, not only in Kentucky but in the Kansas and Missouri territories, where Missouri-Kansas operates, as well.

### Contract to Supply Gas

The Haverhill, Mass., Gas Light Company has just started upon its contract to supply the North Shore Gas Company, a comparatively new concern with gas. This additional service provides gas to Ipswich, Georgetown, Rowley, Wenham, Essex, Hamilton, Topsfield and Manchester-by-the-Sea. The North Shore Gas Company is the successor to the Ipswich Gas Company, now non-existant. The contract between the two companies is for a term of 10 years.

### Seek Authority To Supply Gas

Petitions for authority to supply gas in the town of Oakland City, Ind., has been filed with the Indiana public service commission by the Wabash Public Service Corporation. The town now has no gas supply and the utility is ready to begin installation, the petition set out.

### Encouraging Increase in Gas Sales

An increase of 11 per cent in gas sales for September 1929 as compared with September 1928, is indicated by the first 96 companies reporting to the American Gas Association, according to Paul Ryan, Statistician of the Association. As of September 30, 1929 the customers of these companies representing approximately 80% of the industry, aggregated 9,560,000, an increase of 2.4 per cent over the corresponding date of the preceding year.

Gas sales of these companies for the first nine months of 1929 showed an increase of 9.4 per cent, totaling nearly 324 billion cubic feet as compared with 296 billion cubic feet in the corresponding period of last year.

For the month of September 1929 these 96 companies reported gas sales revenues of $33,900,000, an increase of 4.6 per cent over September 1928. For the nine months ending September 30, the revenues of these companies aggregated $308,200,000, an increase of 4.5 per cent over the corresponding period of 1928.

During the first nine months of the year the amount of coke oven gas produced by the reporting companies increased 33.8 per cent and the amount of coke oven gas purchased by these companies from coke and steel companies for public distribution increased 29.4 per cent. The total amount of coke oven gas distributed by these companies during the first nine months of 1929 was over 107 billion cubic feet or 30% of the total gas distributed. During the corresponding period of last year, coke oven gas constituted 26% of the total distribution of these companies.

During the first nine months of 1929 the production of carburetted water gas decreased more than 9 per cent and the production of coal gas in retort type plants declined more than 8 per cent.

Sales of gas in New England in September 1929 were 7 per cent above September 1928 and for the nine months period the increase was nearly six per cent.

In the Middle Atlantic States sales in September were 3.4 per cent above September 1928, bringing the increase in gas sales for the nine months period up to 2 per cent, which, however, is smaller than the increases registered in all other parts of the country.

September sales in the East North Central States were 7 per cent above September 1928 and sales in this region for the nine months period were 9.5 per cent above the corresponding period of 1928.

All sections of the country report a very satisfactory increase in the sale of gas to industrial-commercial users. The remarkable rate of increase in the sales of gas for house heating established during the early part of the year has been maintained.

### Florida Public Service Co. Opens Merchandise Store

The Florida Public Service Company has opened a gas merchandising store in Orlando, Fla. This company, a part of the Associated Gas & Electric System, has not actively been engaged in the merchandise business for several years, but is reentering the field on a large scale.

The Company will handle standard gas appliances, including gas refrigerators.

H. R. Cloud is Commercial Manager of the Florida Public Service Company and F. C. Bryan is in charge of the Orlando store.

The Florida Public Service Company serves both Orlando and Winter Park and adjoining cities. The Company has 5952 customers and about 100 miles of gas mains.

## Personals

**George R. Jones,** Vice-President and Treasurer of the Public Service Company of Northern Illinois, Chicago, has resigned his position as Assistant to the President and Assistant Treasurer of the Western United Gas and Electric Company and the Western United Corporation, to become President of both companies. Mr. Samuel Insull, who heretofore has been President of these companies, has resigned that office to become Chairman. This announcement followed a meeting of the Board of Directors of these companies recently.

Mr. Jones became connected with the Western United companies in December, 1927, at the time the management of these companies was taken over by Mr. Insull and associates.

In 1911, at the time of the organization of the Public Service Company of Northern Illinois, Mr. Jones was appointed Purchasing Agent in charge of Purchasing and Stores. Prior to that he was Purchasing Agent for the North Shore Electric Company. In 1919 Mr. Jones was made Assistant to Vice-President Gulick, and shortly thereafter he was elected Secretary and Treasurer of the Public Service Company. His election as Vice-President took place in August, 1926.

**Joseph E. Meron,** Foreman, Gas Distribution Department, New York Power & Light Corp., Glens Falls, has been apponted a member of the New York Power Pension Board to complete the term of the late Henry E. Snow, Albany. Mr. Meron is one of the long service employees of the Company, having completed 42 years in its employ. He started in Troy in 1887 and has been located in Glens Falls for the last 35 years. He is a past president of the New York Power Twenty Year Club.

**John J. Winn, Jr.,** Sales Manager of the Fall River, Mass, Gas Works Co., has resigned from this company to accept a position as Development Engineer of the Consolidated Gas Electric Light and Power Company of Baltimore. In his new position Mr. Winn will be in charge of developing the domestic load of the Baltimore Company through the sale of promotional domestic gas appliances.

Coming to Fall River from Haverhill, Massachusetts, in September, 1925, as Chief Industrial Engineer, Mr. Winn established the Industrial Division in the Sales Department of that company over four years ago. He later became Industrial Sales Manager and from this position was promoted to that of Sales Manager, October 25, 1927.

**R. F. Carley** has recently been appointed general manager consolidated Northern and Western Groups of the Illinois Power and Light Corporation, with headquarters in Galesburg, Ill.

**J. P. Alvey,** formerly manager of the Jacksonville Division of the Northern Illinois Group of the Illinois Power and Light Corporation, Jacksonville, has been made manager of the Illinois Valley Division at Ottawa, Ill. J. R. Hoffman succeeds Mr. Alvey at Jacksonville.

**D. L. Cash,** for the past seven years commercial manager for the combined gas and electric utilities at Rockford, Ill., has arrived in Atlanta, Ga., to assume the sales managership of the Atlanta Gas Light company, according to an announcement recently made by M. L. Kane, general manager.

**C. P. Johnson,** formerly of Haverhill, Mass., has been appointed Superintendent of the Gas Department of the Puget Sound Power & Light Company, Bellingham, Wash.

**Joseph T. Sullivan,** formerly superintendent of the water and gas departments of the Sierra Light and Power Company at Reno, Nevada, has been appointed manager of the City Gas Company of Norfolk, Va.

**James A Yunker** has been named superintendent of the Natural Gas Department of the Louisville, Ky., Gas & Electric Company, with Carter M. Lattis as assistant superintendent.

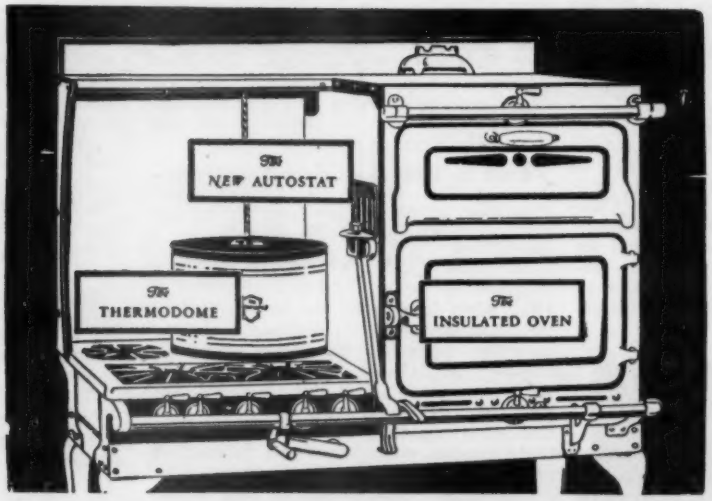
The Natural Gas Department was recently established as the result of a reorganization of various departments concerned with supplying Louisville with natural gas, following the resignation of H. L. Gentry as superintendent of gas transportation to become chief engineer for the Frick-Reid Supply Corporation of Pittsburgh, Pa., and Tulsa, Okla. Mr. Yunker, in addition to his previous duties as gas engineer and land agent, assumed Mr. Gentry's duties.

Mr. Yunker entered the company's service as a clerk in the Engineering Department in 1918 and since that time has worked at practically every phase of the natural gas business.

**E. M. Hutchinson** has taken charge of the new business activities of the Gas Service Company at Monett, Missouri. Mr. Hutchinson is a veteran new business man.

**A. A. Pihlman,** formerly manager of the House Heating and Water Heating Division of the Consolidated Gas Company of New York, has been transferred to the Architects' Service Division as architectural service engineer.

(*Personals Continued on Page 82*)




***The Autostat, which shuts the gas off completely at exactly the right time makes this range more nearly automatic than any other range,—whether gas or electric.***

# Protecting your future market for gas

If electric range manufacturers continue to improve their products, more and more gas patrons will depart from the ranks.

And, electric range interests ARE making appealing improvements.

If gas men continue along conventional lines in sales work, something unfavorable is sure to happen.

BECAUSE the electric people ARE utilizing every modern sales device in putting their proposition over.

The only logical solution is to sell finer gas ranges and to back them with a real sales campaign.

If any manufacturer can show you a more highly developed, more efficient or more convenient gas range than the Chambers Autostat Gas Range, then that is the range you should be selling.

If the Chambers tops all others, you should be selling Chambers.

Furthermore, we have developed a method of selling that fully meets competition and are prepared to promptly co-operate with your sales organization in doing a real job.

We suggest that the Chambers proposition be given serious consideration in arranging your 1930 program.

If you want to protect your future market, if you want the experiences of gas companies who are handling Chambers, we would like to present our proposition by letter or person in an orderly manner.

*The* CHAMBERS MANUFACTURING CO.
***36 Columbus Park*** ***Shelbyville, Indiana***

*Originators of the insulated gas range, the Thermodome and the Autostat*

**Chambers**
**AUTOSTAT GAS RANGE**

**Lloyd Logan,** who is the first person in the United States to receive a doctor's degree in Gas Engineering, has just been granted this degree by the Johns Hopkins University. He received his early education in Brockton, Massachusetts. His subsequent education was alternated over several years with work in various technical capacities and included, in addition to numerous extension courses, various periods at the Royal Technical College, Glasgow, Scotland, Massachusetts Institute of Technology, Columbia University, and the Johns Hopkins University. He was recommended by the Advisory Committee of the School of Engineering of this University on October 4, 1929. His thesis subject was "An Investigation of the Manufacture of Water Gas with Especial Reference to the Decomposition of Steam." His technical experience between 1907 and 1917 included the design of machinery and the layout and construction of industrial, power, and gas plants. During the World War, he served overseas in the Third Canadian Division. He was later engaged in industrial plant development studies. In 1920 he entered the Koppers Company Laboratories, Mellon Institute, Pittsburgh, and later was in charge of the field experimental division of that organization. With the exception of several months spent in research in physical optics, he was with this concern until January, 1926, when he was appointed research associate in Gas Engineering at the Johns Hopkins University. During the past nine years he has been engaged in research and engineering relating to gas purification, coke and by-products, catalytic processes, and water gas manufacture. His publications include papers relating to industrial process control and the manufacture of gas. He holds a number of patents relating to these subjects. He is a member of the American Society of Mechanical Engineers, Society of Chemical Industry, the American Chemical Society, and other societies.

*Lloyd Logan*

**D. M. Wilson** was recently transferred to the Pittsburgh District of the Columbus Gas & Electric Corporation. Mr. Wilson has been very successfully a Director in the Columbus Group of Companies and also Vice-President, in charge of all field matters. He has been elected Vice-President of the following Pittsburgh properties, Fayette County Gas Co., The Manufacturers Light & Heat Co., Natural Gas Company of West Virginia, Pennsylvania Fuel Supply Co., Greensboro Gas Co., Manufacturers Gas Co.

**Fred B. Hofft** was elected vice president of The United Gas Improvement Company at the recent meeting of the company's Executive Committee.

Mr. Hofft was graduated in electrical engineering from Purdue University in 1902, when he entered the employment of the Indianapolis Street Railway Company on power house and substation operation. In 1903 he became associated with the Merchants Heat and Light Company, Indianapolis, of which he later became general superintendent, and in 1909 he was made general manager of the Monmouth (Ill.) Public Service Company, a consolidation of electric light, gas, steam heating and ice manufacturing plants.

*Fred B. Hofft*

In 1912 he was made general manager of the Olean (N. Y.) Electric Light and Power Co. and vice president of the Erie (Pa.) Lighting Co., the latter company then being under the management of Day & Zimmermann Co. of Philadelphi.a.

When the Erie Lighting Co. became a part of the Penn Public Service Corporation in 1923, Mr. Hofft was elected vice president in charge of operations for the northwest region of that company, and in 1927 was placed in charge of the entire Penn Public system—now the Pennsylvania Electric Company—with headquarters at Johnstown, Pa.

Mr. Hofft will shortly take up his new duties and will make his home in Philadelphia.

**R. P. Wagner** was recently made Manager of the newly created Rate and Research Division of the Commercial Department, of the New York Power & Light Corp., Albany. Mr. Wagner will make studies, investigations and analyses of all matters relating to gas and electric rates. Before coming to the Albany office, he was assistant to T. C. Hamilton, Consulting Rate Expert, H. L. Doherty Company, New York City. Previous to this, he was General Superintendent of the Durham Public Service Company of North Carolina.

**S. D. Darley** has been appointed new merchandise sales manager of the Illinois Power & Light Corporation at Danville, Ill.

**Stuart Cooper** was elected vice president of the United Gas Improvement Company at a recent meeting of the company's Executive Committee, according to announcement by John E. Zimmermann, U. G. I. president.

Mr. Cooper has had many years' experience in public utility operation and management.

He began his business career with the Syracuse (N. Y.) Lighting Company, a U. G. I. subsidiary, in 1905, as a meter tester, where he advanced to assistant superintendent. In 1910 he entered Syracuse University from which he received the degree of electrical engineer in 1914. Subsequently, he was assistant to the electrical engineer of U. G. I., and held important positions with the Counties Gas & Electric Company, Norristown, Pa., and the Charleston (S. C.) Consolidated Railway & Lighting Company, both U. G. I. subsidiaries, of which latter company he was vice president and general manager, and president of the South Carolina Power Company, the successor of the Consolidated company.

*Stuart Cooper*

In July, 1928, he became vice president of the Philadelphia Suburban-Counties Gas & Electric Company, which recently was merged with the Philadelphia Electric Company.

(*Personals Continued on Page 84*)

# *for there's a* TIME-O-STAT *Distributor near you!*

**WHEREVER you are—there is a Time-O-Stat Distributor within over-night shipping distance, prepared to take care of your requirements on all standard Time-O-Stat controls.**

**Five branch offices and twenty-five exclusive Distributors—located in the important industrial centers of the United States and Canada —offer Dealers and customers close contact and friendly, efficient service.**

**Each Distributor carries a complete stock of Time-O-Stat products. He can fill your orders quickly, without waiting for shipments from the factory.**

**Moreover, each Distributor has a service organization skilled in handling Time-O-Stat products and gives cheerful cooperation to all Dealers and users of Time-O-Stat controls. You will find it a real pleasure to work with a Time-O-Stat Distributor.**

**Notice the completeness of the Time-O-Stat line of automatic controls listed below. Write for catalogs of the products which interest you.**

**Time-O-Stat's extensive research laboratories welcome the opportunity to work out your special problems of automatic control.**

**TIME-O-STAT CONTROLS COMPANY**
**ELKHART INDIANA**

Successor to
ABSOLUTE CON-TAC-TOR CORP.
TIME-O-STAT CORP.
LEACHWOOD COMPANY
CRAMBLET ENGINEERING CORP.

**EXCLUSIVE TIME-O-STAT SERVICE**

*Factory Sales and Service Offices*

① Boston, Mass.
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Chicago, Ill.
4 Cincinnati, O.
5 Cleveland, O.
6 Columbus, O.
7 Dallas, Texas
8 Denver, Colo.
9 Los Angeles, Cal.
10 Milwaukee, Wis.
11 Minneapolis, Minn.
12 Newark, N. J.
New York, N. Y.
13 Oklahoma City
14 Omaha, Neb.
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18 Salt Lake City, Ut.
19 San Francisco, Cal
20 Seattle, Wash.
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*Exclusive Distributors*

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2 Birmingham, Ala.
3 Buffalo, N. Y.

*In Canada*

22 Montreal, Province of Quebec
23 Toronto, Province of Ontario

*Export Office*

New York City
New York

**Manufacturers of AUTOMATIC CONTROLS for Oil Burners · Gas Burners · Coal Burners · Electric Refrigerators · Furnace Fans · Mechanical Stokers · Industrial Ovens · Ice Machines · Unit Heaters · also of Sign Flashers · Mercury Switches · Electric Heaters · Corrugated Metal Bellows**

**R. C. Brosius,** Manager of the Union Public Service Co., at Fort Scott, Kansas, has been selected to serve as one of the directors of the Fort Scott Chamber of Commerce. Mr. Brosius has only been in Fort Scott a short time going there as manager of the new company from Hutchinson where he had been superintendent of the Hutchinson Gas Company for a number of years.

**C. C. Adams** was recently promoted to the position of Merchandise Manager of the Faribault, Minn., Division of the Northern States Power Company.

**W. M. McCloy** has been appointed General Manager of Production of The Ohio Fuel Gas Company and the Preston Oil Company, Columbus, Ohio, following the transfer of Mr. D. M. Wilson to an advanced position with the Pittsburgh Group of the Columbus Gas & Electric Corp.

**M. Solomon,** formerly in charge of gas and electric sales of the Oak Park office of the Public Service Company of Northern Illinois, has been made Sales Supervisor of the Maywood office.

**E. W. Fowler** succeeds M. L. Harry, deceased, as general manager of Central Illinois Group of the Illinois Power and Light Corporation, with headquarters at Decatur, Ill. Mr. Fowler has been connected with the Illinois Power and Light Corporation and its component properties for a number of years.

**J. S. Mayer,** formerly of the service department of the St. Paul, Minn., division, of the Northern States Power Company, has been transferred to the Grand Forks, N. D., division as gas superintendent.

**Zeb Watkins,** of the Southern Public Utilities Company, Charlotte, N. C., was the winner of the first prize of $75 in the recent annual gas range campaign conducted by the aforementioned company. He sold 112 ranges in 5 weeks.

**F. T. Head** was recently appointed manager of the House Heating and Water Heating Division of the Consolidated Gas Company of New York. He was formerly sales manager of this company, and is succeeded by Andrew Bergmann.

**Morris F. Wales** has been appointed Chief Collector of the Los Angeles Calif. Gas and Electric Company. Mr. Wales is an accountant and has had eleven years of public utility experience. He has been Auditor and Commercial Manager of the Coast Counties Gas and Electric Company.

**Robert W. Haver,** combination salesman, Plainfield Commercial Office of the Public Service Corporation of New Jersey, earned the right, by his sales to attend the eleventh annual convention of the American Gas Association, held in Atlantic City in October. This is the second time in succession that he won a trip to Atlantic City.

**William Hutton Blauvelt** has been appointed Manager of Gas Engineering of the Columbia Engineering & Management Corporation — a subsidiary of Columbia Gas & Electric Corporaton, 61 Broadway, New York City. For the past seven and a half years, Mr. Blauvelt has been engaged in consulting engineering work, specializing in problems pertaining to coal, gas and oil. During this period he has served many of our leading gas utilities and has taken an active part in the development of the gas business. With the acceptance of his new position, Mr. Blauvelt closes his consulting engineering office at 120 Broadway, New York City.

*William Hutton Blauvelt*

Charles R. Bellamy, who has been associated with Mr. Blauvelt in consulting practice has joined the organization of the Columbia Engineering & Management Corporation as gas engineer with headquarters at 61 Broadway, New York City.

**H. F. Hammond** was recently appointed Supervisor of Gas and Electric Sales of the Oak Park office of the Public Service Company of Northern Illinois.

# Obituary

### R. M. SEARLE

Robert M. Searle, president of the Rochester Gas & Electric Company, was found dead at his home in Rochester on November 13th. He was 60 years of age.

It is said that one of Mr. Searle's first jobs was that of office boy for Thomas A. Edison. Later he was employed by the United Gas Improvement Company, Philadelphia, where he was promoted from boiler fireman and gas maker to superintendent and engineer of a number of plants. He later became operating executive of the Westchester Lighting Company.

In 1906 Mr. Searle was appointed general manager of the Rochester Railway & Light Company, which later became the Rochester Gas & Electric Corporation and Mr. Searle was advanced to vice-presidency and later to presidency. He remained head of this corporation, although there were numerous changes in ownership.

Mr. Searle was active in civic affairs. He was also a notable inventor and engineer. At his death he was president and director of the Rochester Gas & Electric Corp., the Mount Morris Illuminating Company, the Mount Morris Water Power Company, the Genesee Gas Light Company, the Caneadea Power Corporation, the Hilton Electric Light, Power & Heat Company, and the Cooper Electric Corporation, and was a director of the Security Trust Company of Rochester.

### ROBERT T. HUSTON

Robert T. Huston, Vice-President and Superintendent of the Connersville Blower Company, died suddenly at his home on the evening of November 14, due to an acute heart attack.

Mr. Huston had been connected with the Connersville Blower Company since its organization in 1893. In addition to his interest in building up and maintaining the factory equipment and efficiency, he was active in other industrial, civic, lodge and social work of the city.

### New Gas Wells Recently Brought In

Natural gas wells were recently brought in, in the Laredo Texa district, by the Magnolia Petroleum Company, its No 1 Luncell in the Schoolfield-O'Byrne field, making 15 million cubic feet from a depth ot 2,326 feet. In the same territory, the Co-operative Drilling Company brought in its No 3 Dinn in the Cole field on the John Dinn ranch.

The Texas Corporation, early in November completed a natural gas well on the Bartram structure, northern Moffat county, Colorado, yielding 25 million cubic feet of gas daily. This is practically virgin ground and gives the state a new gas field.

The Red Bank Oil Company in LeFlore county Oklahoma, encountered a natural gas flow of 35 million cubic feet, at a depth of 5,400 feet.

### 24 Uses For Flow Meters

The Brown Instrument Company, Philadelphia, Pa. recently issued a catalog entitled "Why You Should Use Flow Meters". In the foreword they say that there are 24 ways in which flow meters reduce steam costs, and there is a chapter devoted to each, showing several illustrations. The catalog is printed in two colors. A copy will be mailed on request.

# RE-CHROME METER LEATHER

## *Has Proved Itself!*

*Here's the Proof!*

On page 7 of the published report of the A. G. A. Subcommittee on meters, for 1929—under the caption "The Life of Diaphragms of Semi-Chrome Leather Compared with Those of Bark Tanned Leather Operating in Service Under Similar Conditions," appears the following report from a large artificial gas company, it reads:—

"Thirty meters were set with bark tanned leather diaphragms on one side and semi-chrome on the other side and were left in service for thirty-seven months. They were set in a district where we were having a great deal of trouble from non-registering meters, due to an excessive amount of condensate rotting the diaphragms. Upon removal these meters were opened up and the diaphragms inspected. Without exception, the semi-chromed leathers were in excellent condition while in every case the bark tanned leathers were in bad shape, many having holes rotted through them.

"Stress is laid on the importance of ascertaining by test that the tannage is a true semi-chrome and that the skins have been uniformly treated, as it is reported that frequently skins which were purchased for semi-chrome leather were found to have been improperly retanned and often a skin was found with patches entirely free from any traces of chrome.

"It is interesting to note that in the various reports on this subject all were favorably impressed with the possibilities of this leather and not a single adverse report was received."

In connection with the second paragraph above we say—

BESSE, OSBORN & ODELL INC. · COLONIAL · BRAND · BOSTON, U.S.A. · RE-CHROME METER LEATHER

*This trade-mark, stamped on each New Zealand Lamb skin, is our guarantee to you that each skin has received the greatest care in its selection and tanning.*

*Be sure to specify "Colonial Brand" Re-chrome Diaphragms in your meters.*

## COLONIAL BRAND RE-CHROME METER LEATHER

**is Guaranteed 100% PERFECT Re-Chrome Tannage**

## BESSE, OSBORN & ODELL, INC.

51 SOUTH STREET - BOSTON, MASS.

New York—177 William Street
W. A. Smith—G. Norman Bankart, Representatives.

*Tanneries:* Clinton, Me. *and* Peabody, Mass.

# Construction and Trade News

### United Engineers & Constructors, Inc., Activities

The Union Gas and Electric Company of Cincinnati, Ohio, have awarded a contract for one (1) 7'6" U. G. I. Vertical Waste Heat Boiler, with necessary connections to the existing 12' Carburetted Water Gas Set.

The Philadelphia Suburban-Counties Gas and Electric Co. has contracted for the installation of approximately 61,000 feet of 12" main from Phoenixville to Pottstown, Pa. Consumers Gas Company, Reading, Pa. have authorized installation of new 12" lines for existing compressor units. The Charles H. Tenney of Boston, Mass., have awarded contract for a 7' U. G. I. 4-pass high duty condenser, to take care of additional condensing requirements at their Brockton plant.

The Central States Electric Company of Cedar Rapids, Iowa, have awarded contract for one. (1) 5' cone top U. G. I. Carburetted Water Gas Set and Chrisman Cycle, and circular steel platform. The set will be arranged for the use of bituminous coal as generator fuel and the set will be operated from the ground floor.

The Indiana Consumers Gas and By-Products Company, Terre Haute, Ind., has contracted for the installation of 362,320 feet of 6" and 2" main from Terre Haute to Martinsville, Indiana, along the State Highway, Route 43 to Green-Castle, Indiana.

The Syracuse Lighting Company, Inc., has contracted for the installation of 12,000 feet of 4" main from Manlius to Syracuse, N. Y.

The Central Public Service Company of Chicago, Ill., have awarded contract for additional condensing and gas cleaning equipment, for the Chambersburg, Pa. plant. This equipment will consist of U. G. I. 4-pass, high duty condenser, and a U. G. I. Immersion Washer.

### Lloyd B. Stewart with Pittsburgh Equitable Meter Company

Announcement has been made to the effect that Mr. Lloyd B. Stewart will represent the Pittsburgh Equitable Meter Company in the State of Kansas.

Mr. Stewart has had many years' experience in the Gas Industry. His work follows the footsteps of his father, Mr. C. D. Stewart, who is well-known to all Natural Gas men. Mr. Stewart started working in the Gas Industry at an early age. During his high school days in 1916 and 1917 he worked after school hours for the Quapaw Gas Company at Joplin, Missouri, in their meter shop. Later on he worked for the Wichita Natural Gas Company at Wichita, Kansas, in their meter shop testing and repairing domestic meters and regulators, and also was called upon to repair equipment in the field part of the time. In 1922 and 1923 he was connected with the Wellington Gas Company in Wellington, Kansas, in the capacity of Testor and Repairman on meters and regulators. Later he attended the University of Kansas and after school hours worked for the Lawrence Gas Company as a meter reader.

In 1925 Mr. Stewart was made Superintendent of the Eureka Gas Company in Eureka, Kansas, where he installed a complete new distribution system. The following two years he acted as manager of the Vinita Fuel Company at Vinita, Oklahoma, leaving there to become an Independent Meter Testor at Chanute, Kansas. However, later on all the Independent Companies in that section were merged into a company known as the Southern Kansas Gas Company which company was eventually taken over by the Oklahoma Natural Gas Company. Mr. Stewart was Superintendent of the gas measurement during the life of the Southern Kansas Gas Company and was then made Assistant Division Superintendent for the Oklahoma Natural Gas Company.

### Booklet Issued On Quigley Acid Proof Cement

Quigley Furnace Specialties Co., 56 West 45th St., New York have issued a booklet describing the qualities and uses of Quigley Acid Proof Cement. This product is used for bonding acid proof masonry in a variety of industries and finds considerable application in stack construction and in equipment handling hot acid gases.

### Combustion Engineering Co. Open District Office in Seattle, Wash.

Combustion Engineering Corporation announces the opening of a district office at Room 606, 1411 Fourth Avenue, Seattle, Wash. Mr. George M. Bechtel, recently of the Los Angeles office of Combustion Engineering Corporation has been appointed branch manager.

The Macco Construction Company have been awarded the general contract exclusive of hauling and welding; the Asbury Transportation Company will unload, haul, and string the pipe, and the A. O. Smith Co. will furnish the pipe and do the field welding.

### Oxwelded Piping

A 24-page booklet containing helpful and instructive information on the installation of Oxy-Acetylene Welded Piping for industrial uses and also for the heating of domestic and industrial buildings.

The first section considers the uses of Oxwelded piping in industrial plants including piping for the transportation of oil, gas, chemicals, water, etc., and the second section deals mainly with piping for heating and heating systems. Copies of this are available from The Linde Air Products Company, 30 East 42nd Street, New York, N. Y. or from any of their 26 district sales offices which are located in the principal cities of the country.

### Semet-Solvay Engineering Corp. Contracts

A purifier installation for Cia. Cubana de Electricidad of Havana, Cuba, has been purchased by Phoenix Utility Company of New York. The installation will comprise a four-compartment purifier, a hand-operated gantry crane, a rotating purifier manifold with reversal crossover and complete oxide handling equipment.

An order for three multiple washers of standard design, having a capacity of six million cubic feet per 24 hours, has been placed by Coal Products Manufacturing Co., of Joliet, Ill. The necessary valves, fittings and piping required for operation are included.

The Wisconsin Power & Light Company Fond du Lac has placed an order for gas cleansing equipment, consisting of a washer cooler, four stacks of cooling coils, a multiple washer, an intensive scrubber and the pipe and fittings necessary for the installation.

### New Judelson Dryer Catalog

The Judelson Dryer Corporation, Moundsville, West Virginia, have recently issued Catalog No. 29 describing their complete line of clothes dryers, both drawer and cabinet styles. Judelson Dryers operate with natural, manufactured or mixed gas; also with Pyrofax and similar gases. Copy may be obtained upon request.

### Dr. Taylor of Electrolux—Servel Laboratory to Study Household Refrigeration Industry in Europe

Dr. R. S. Taylor, Assistant Director of the Electrolux-Servel laboratory in New York, has left for an extended trip to Europe, where he will make a study of the household refrigeration industry in England and Sweden. While in Stockholm, Dr. Taylor will visit the A. D. Electrolux plant. It was in Stockholm that the Electrolux was invented by Balzar von Palten and Carl Munters while they were studying at the Royal Institute of Technology in 1921.

*(Trade News Continued on Page 88)*

# *For RESULTS!*

## The CLEVELAND BABY DIGGER

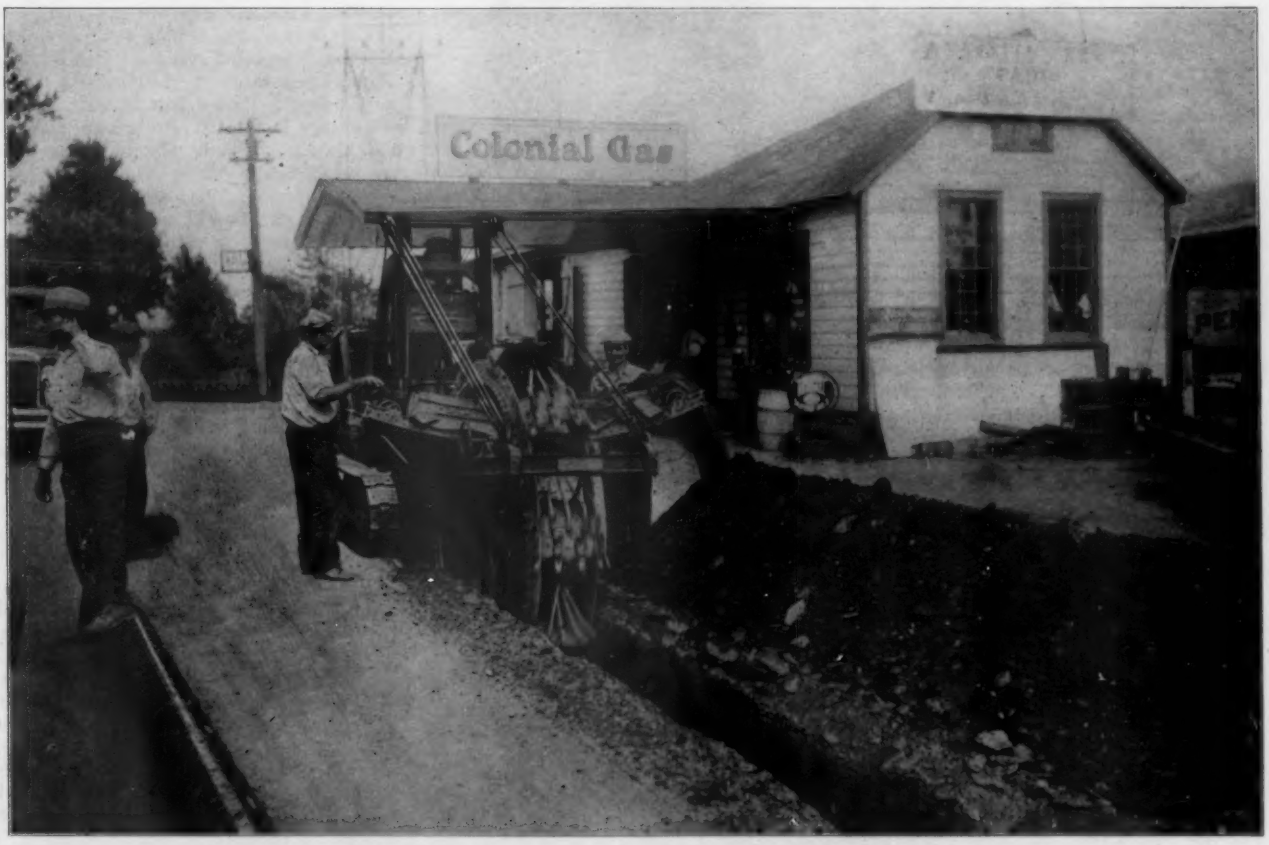
**PUBLIC utilities in all parts of the country have found the speed and economy of the Baby Digger so effective that they have been able to greatly increase the number of extensions of their lines thus bringing additional revenue. With the Baby Digger they have dug hundreds of miles of trench in the heart of some of the largest cities, where underground pipes abound, with minimum disturbance to property and the general public.**

**Compact, mobile, powerful, sturdy and fast the Baby Digger is especially designed to deliver maximum results in gas trench construction.**

**It is only 58″ in extreme width. Think what this means when your line of trench must pass close to trees, buildings, poles, etc., along the edge of highways or down narrow alleys. It slipes easily by, around, and between these obstructions.**

**Easily and quickly transported on its own specially built trailer from job to job, the Baby Digger materially increases productive time.**

**You can not afford to be without Baby Digger economies in your 1930 trenching work. Write today for full information.**




**The above picture shows one of several Cleveland Baby Diggers in the service of the United Engineers Construction Company, (Division of U.G.I.,) Philadelphia, Pa. This trencher was being used on a forty mile pipe line job between Utica and Syracuse, digging hard-packed roadway at a speed of eight inches per minute**

**THE CLEVELAND TRENCHER COMPANY**

***Pioneers of the Small Trencher***

**20100 St. Clair Ave., — Cleveland, Ohio**

**THE BABY DIGGER**

### J. H. Hill Resigns from Pittsburgh Equitable Meter Company

Mr. J. H. Hill who had for the past twenty-two years been connected with the Pittsburgh Equitable Meter Co., the last fifteen of which he had been district manager with offices in the Union Bank Bldg., Los Angeles, tendered his resignation, effective December first in order that he may devote his entire time to private business interests.

Mr. Walter H. Davis, who for the past fifteen years, has represented the Pittsburgh Equitable Meter Co., in Kansas and Missouri has been appointed to succeed Mr. Hill as district manager at Los Angeles. Mr. Davis assumed his duties there December first. He has had an exceptionally wide experience both in the gas and water industry and is particularly well equipped for the duties he is now entering upon.

Coincident with the announcement of Mr. Hill's retiring, comes word that the Pittsburgh Equitable Meter Company has leased a large building at 1918 East Seventh St., Los Angeles, in the heart of the industrial district of the city. This building, modern in every respect and complete in every detail will be used as the companies Pacific Coast offices and plant. A complete stock of water, oil, gasoline, gas meters and gas regulators will be carried at all times with complete lines of repair parts for these products.

The most modern shop equipment will be installed and men trained by year of experience at the companies main factory in Pittsburgh, will be transferred to the Los Angeles branch. These men will have complete charge of the shop assembly work and the maintenance of meters in the Southwest territory. Assembly of all company products will be done in this branch factory which will be prepared to give complete service of any kind.

### Plant Addition Strengthens Sullivan Production

Sullivan Machinery Company, Chicago, reports an increase in the demand for its products during the current year, including air compressors, mining and quarrying machinery, core drills, portable air compressors, concrete breakers, rock drills, portable hoists, etc.

To meet this growing demand, the Company has recently completed the construction of an addition to its Michigan City, Indiana Plant.

Machine tool equipment at both the Claremont, N. H., and Michigan City, Indiana, plants has been increased during the year, and orders are already placed for additional tools, which will secure a larger volume of production.

### Alexander Milburn Opens Los Angeles Office

The Alexander Milburn Company, 1416-1428 W. Baltimore Street, Baltimore, Maryland, manufacturers of Welding and Cutting Apparatus, Portable Carbide Lights, and Paint and Lacquer Spraying Equipment has opened an office in Los Angeles operating as The Alexander Milburn Sales Company, 1855 Industrial St., Los Angeles, Calif.

This office is under the supervision of Mr. George R. Roberts, well known on the Pacific Coast among the users of welding and cutting equipment while in the employ of the Purox Company

### Betsy Ross House Gets Modern Heating

Custodians of the Betsy Ross House, "Birthplace of Old Glory," have decided that the quaint charm of open fire-places hardly offsets the fire hazard, dirt and

work incidental to this old-fashioned heating device, and have installed Gasteam radiators in the famous old shrine.

The Betsy Ross House on Arch street, Philadelphia, at the time of the Revolution was an upholster's shop kept by John Ross who later gave his life fighting for American independence. In May 1776, Washington and a committee employed Ross' daughter, Betsy, to make a sample flag containing thirteen stars and stripes, symbolic of the original thirteen American Colonies. So pleased was the committee with the work of Miss Betsy that her flag was made the national ensign.

So precious a national shrine has this little shop become that the custodians decided to install a heating system which would reduce fire hazard to a minimum, besides furnishing adequate and efficient heating. Clow Gasteam radiators were chosen.

### New Naylor Pipe Co. Bulletin

The Naylor Pipe Co., Chicago, Ill., have just issued a bulletin No. 29-2 describing "Naylor Spiralweld" Pipe. It is stated in the foreword in the bulletin that "Naylor Spiralweld Pipe involves new engineering features that have never been used before. A spiral lock-seam truss welded to the wall of the pipe provides a mechanically correct structure which gives maximum structural strength with minimum weight —an important point in saving freight and handling charges.

The Naylor spiral lock seam electrically welded by the Naylor process results in a continuous spiral truss with a strength four times the thickness of the wall. The structure provides a cushion to absorb loads and take care of normal expansion and contraction in each pipe joint."

It is freely illustrated with photographic reproductions taken of various pipe laying operations. A copy will be mailed on request.

### General Refractories Co. Appoints Pittsburgh Representatives

General Refractories Company, Philadelphia, Pa., has recently appointed the Harris Pump and Supply Company, 319-21 First Avenue, Pittsburgh, Pa., as their High Temperature Cement dealer representatives in the Pittsburgh district. Their territory will cover the western half of Pennsylvania, coming as far east as Williamsport. It will also cover the northern part of West Virginia, going as far west as Tyler County and east to Hardy County. It will also include the eastern edge of Ohio, covering the counties of Trumbull, Mahoning, Columbiana, Jefferson and Belmont. It will also include the western end of Maryland, covering the counties of Garrett and Allephany.

The commodities which this dealer will handle are Grefco Chrome High Temperature Cement and Standard Silica Bonding Cement.

### Volume Water Heating

The Ruud Manufacturing Co., Pittsburgh, Pa., have issued a catalog, entitled "Volume Water Heating". It describes the Ruud Multi-coil automatic storage systems. This is only one catalog of a complete set of literature on this subject. It is complete in illustrations of their various units, as well as complete descriptions of the burners, automatic gas cut-off, Rund movement valve, with chapters on factory and industrial installations. A copy will be mailed on request.

### Connersville Blower Company Issues New Bulletin No. 110

The Connersville Blower Company, Connersville, Ind., have issued Bulletin No. 110 describing the "R-S" and "R-B" series of Connersville Rotary Positive Blowers suitable for medium range of volumes and pressure. In addition to the description of the general operating characteristics of the blowers, the Bulletin also contains revised ratings based on the improvements in the blower construction, which permits higher operating speeds. A copy will be mailed on request.

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**Gas Meters**
**Provers**
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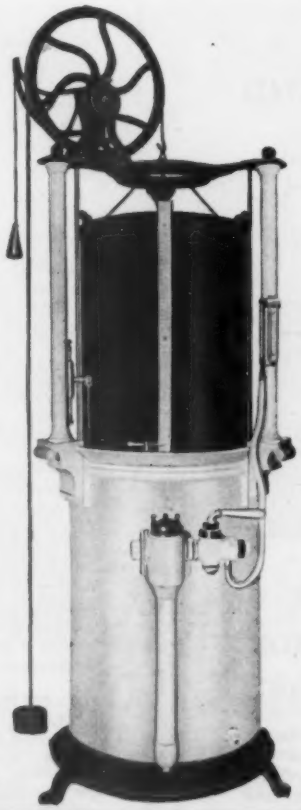

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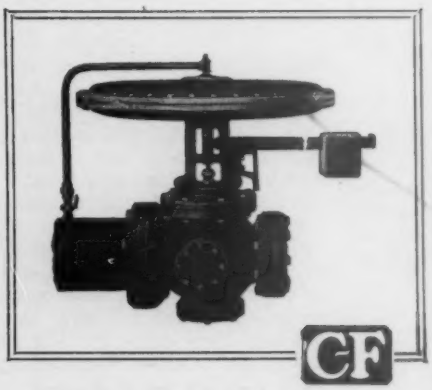


## *Low Pressure Regulator*

**Efficient regulation depends upon the accuracy of the regulation equipment. For more than 40 years the Chaplin-Fulton Manufacturing Company has made regulating devices for the gas industry. That the aim to make the most accurate and reliable equipment possible has been reflected in the Chaplin-Fulton series of regulators, is evidenced by their popularity and standing with the foremost gas companies.**

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**IT is a costly job to lay several lines of pipe across a stream—costly in time, labor, and extra material and equipment involved. Experienced engineers know just where to begin in making certain that the investment will be properly safeguarded. They first make sure of the right pipe—knowing that this is the foundation of successful submerged pipe lines.**

**The photograph above shows one of the crossings of a 200 mile, 18-inch, NATIONAL Pipe line. Laying of this line involved crossing the Mississippi and four other rivers in addition to swamps, stretches of gumbo, etc.—a job requiring sound engineering practice and reliable materials.**

**The extensive use of NATIONAL Pipe for lines involving exceptional engineering difficulties is substantial evidence of the dependability of this product for installation where future repairs would be costly with possible extended delay of service. Dependability under all conditions of service is the first requirement in the manufacture of NATIONAL Pipe—one of the reasons why NATIONAL is**

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# NATIONAL PIPE

# AMERICAN
# Gas Maker's Gauge

**The American Gas Maker's Gauge is constructed so that there is perfect protection against loss of calibration due to accidental overloading. And in case of excess pressure, this gauge cannot be injured.**

**The full arc scale of 280°, with the subdivisions evenly graduated, shows the slightest fluctuation in single inches of water pressure.**

**Made in black enameled case and ring with either bottom or back connection. The dial sizes are 4½", 6", and 10". The standard ranges, in inches of water pressure, are: 0-20, 0-30, 0-60, 0-100 and 0-150.**

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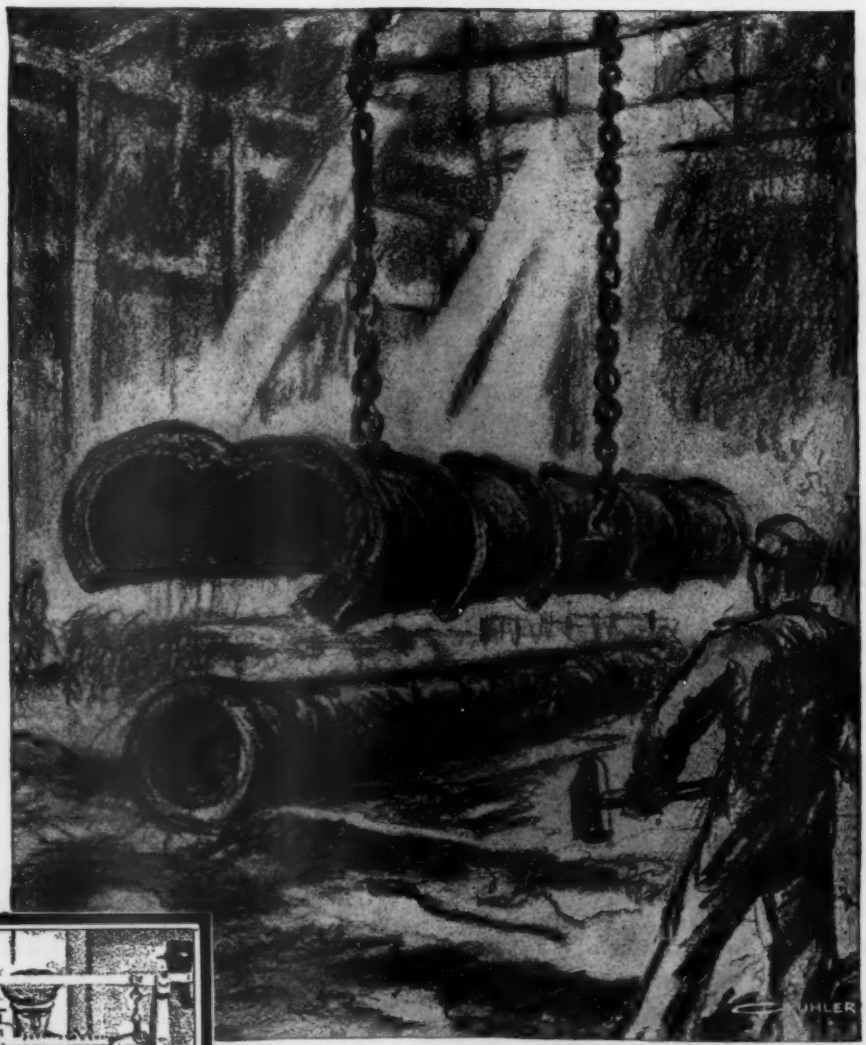
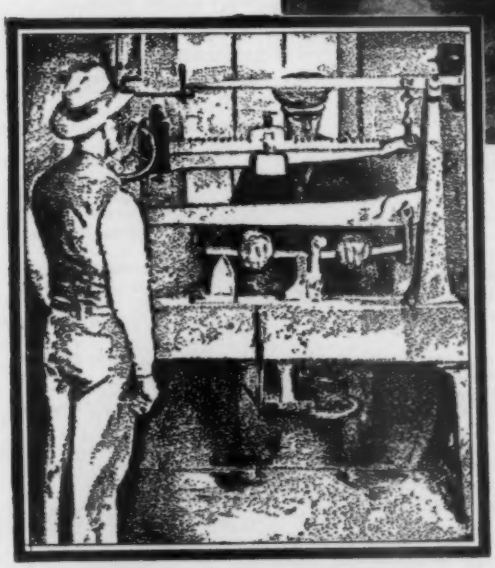


In the modern foundry, cast iron specimen bars 26″ x 2″ x 1″ are tested from each run of metal. The bars when placed flatwise upon supports 24 inches apart must sustain a load of 2000 pounds at the center and show a deflection of not less than .30 inches before breaking.



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* * *

The Cast Iron Pipe Research Association is a service organization of leading pipe founders, formed to promote the scientific improvement and proper use of Cast Iron Pipe. Pipe bearing the Association "Q-check" mark may be obtained from the following: Alabama Pipe Company, Anniston, Ala.; American Cast Iron Pipe Co., Birmingham, Ala.; James B. Clow & Sons, 219 N. Talman Ave., Chicago, Ill.; Donaldson Iron Company, Emaus, Pa.; Glamorgan Pipe and Foundry Co., Lynchburg, Va.; Lynchburg Foundry Company, Lynchburg, Va.; National Cast Iron Pipe Company, Birmingham, Ala.; United States Pipe & Foundry Company, Burlington, N. J.; Warren Foundry and Pipe Company, 11 Broadway, New York City.

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CAST Q IRON

*The "Q-check" symbol shown above has been adopted as the trade mark of The Cast Iron Pipe Research Association. Insist on this "Q-check" mark when specifying cast iron pipe for gas, water, sewer, or industrial service.*

*For complete information write to The Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago.*

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**Are a quick and efficient means of locating gas leaks. As soon as the gauges show a leak somewhere along the line, it may be traced by driving small holes along the main and using one of these Indicators. The hand will indicate the place of greatest flow and the leak may be then fixed.**

**Instruments indicate the presence of either heavy or light gas.**

***TYCOS* Gas Leak Indicator No. 3405**

Comes completely equipped in sole leather carrying case with strap, weight about 1¾ pounds.

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Improved type, vertical form. In sole leather carrying case with strap, weight about 1¾-pounds.

***Write for additional information and TYCOS Gas Catalog.***

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# *Liberal Strength . . . and Success*

VS.

# *The Last Straw*

**Pittsburgh Seamless steel casing may be run down at least one-third deeper than welded casing—and still maintain a saftey factor of 2.**

LIKE the straw that breaks the camel's back, it is the last few pounds of added strain that causes the failure of ordinary casing . . . and perhaps a lost hole.

Only 5% additional strength in the casing may carry the load and leave the string intact.

10% to 15% additional strength gives a fair margin of safety and a comfortable feeling of confidence in completing the well.

But the 30% to 40% greater strength of Pittsburgh Seamless Steel casing affords the liberal margin of safety that assures successful completion of the well.

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DIVISION OF
**Pittsburgh Steel Co.**

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**Casing** **Drill Pipe**
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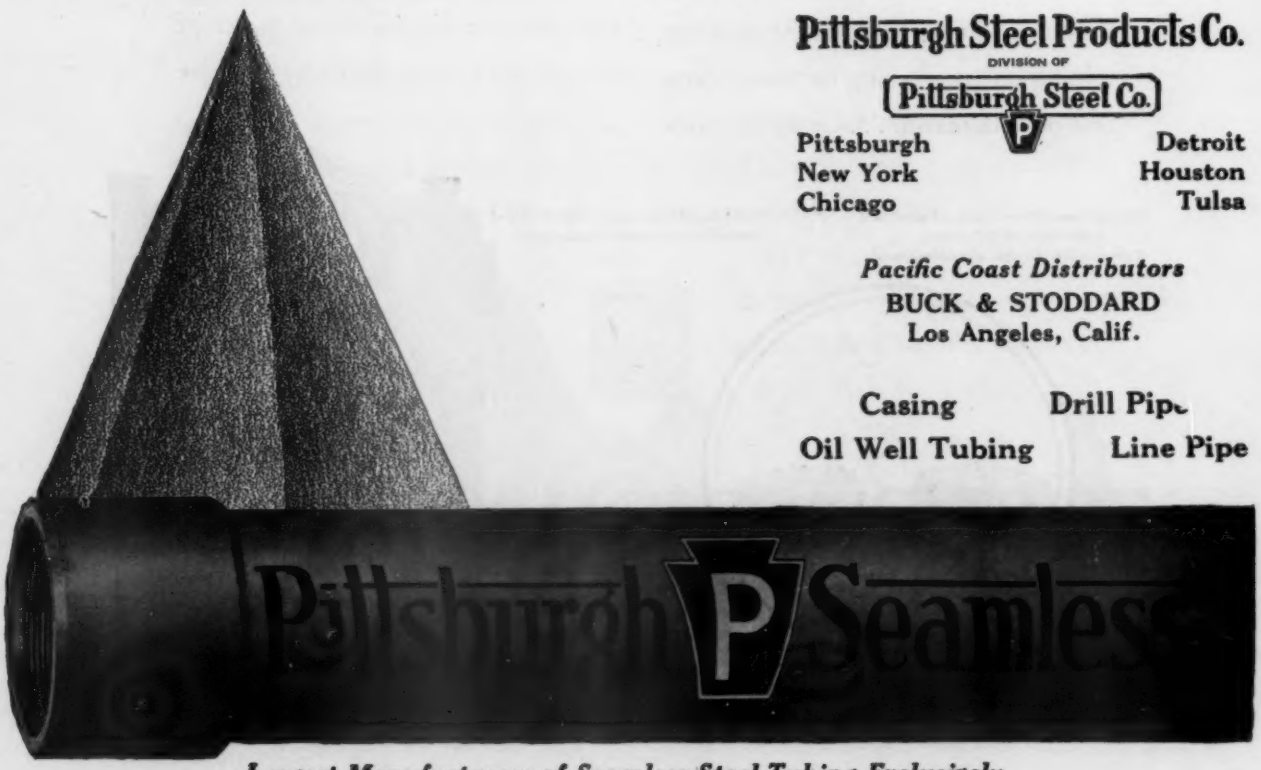



***Largest Manufacturers of Seamless Steel Tubing Exclusively***

# Can you give him a better rate?

CAN you afford to meet this large consumer's request for a better rate?

That depends in part on the character of his demand upon your gas supply.

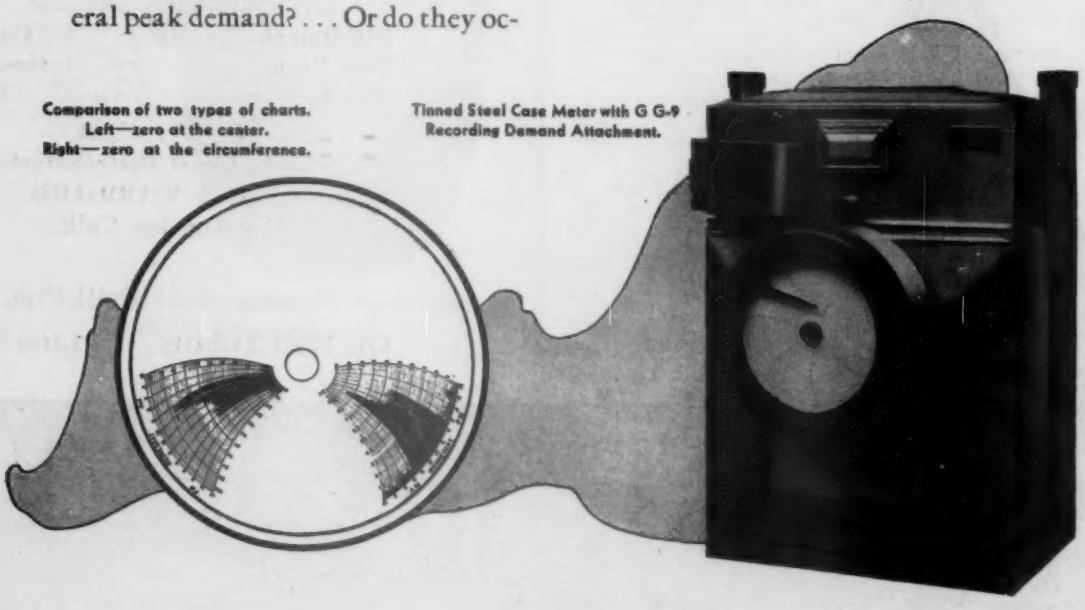
Should you help him redistribute his consumption? Are the peaks of his demand very high? Do they come when you are striving to meet a general peak demand? . . . Or do they occur when the general demand is low?

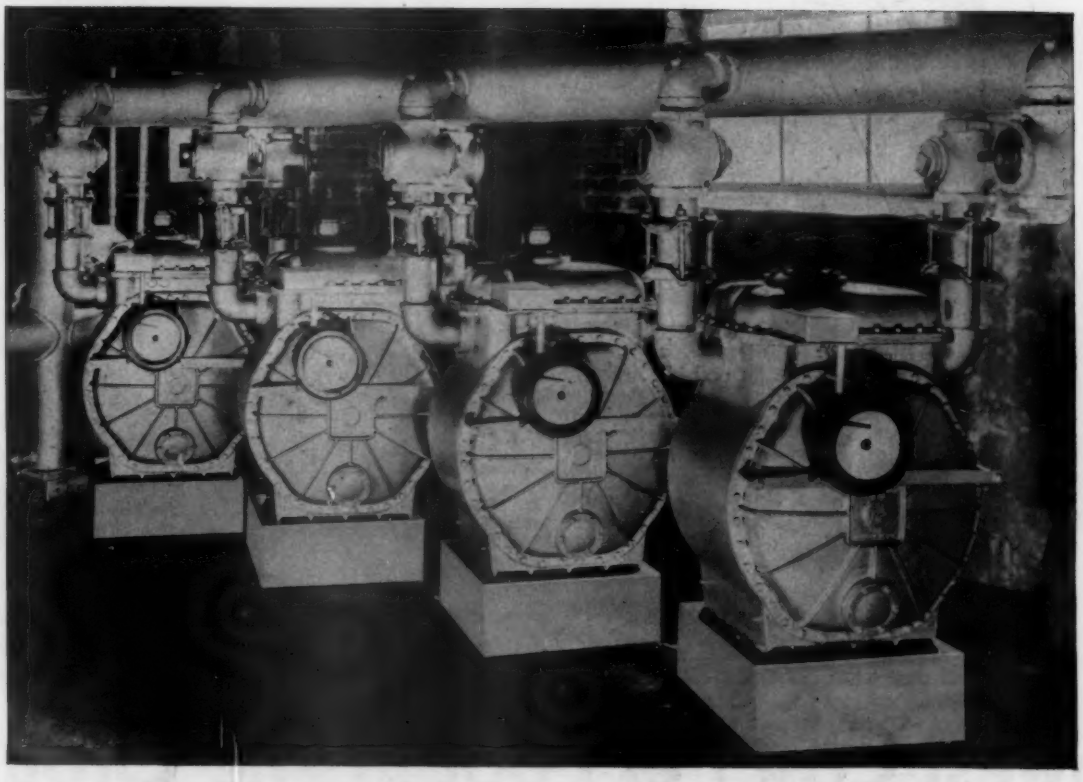
These and similar questions are accurately answered by the G G-9 Recording Demand Meter.

The Recording Demand Meter is composed of two parts, the meter proper and the demand device—designed to be easily attached to any positive displacement meter of our manufacture. Capacity of the

Comparison of two types of charts. Left—zero at the center. Right—zero at the circumference.

Tinned Steel Case Meter with G G-9 Recording Demand Attachment.





**An actual photograph of an Industrial Installation showing 4-500 "B" Metric Iron Case Meters equipped with G G-9 Recording Demand Attachments operating on the lines of the Public Service Company of Northern Illinois.**

meter required will be governed by the probable maximum hourly consumption.

The timing element is an eight-day clock with jeweled bearings. Or, if it is desired, a Warren Motor, operating on 60 cycles, 110 volts, can be supplied.

Registration is on waxed seven day charts. These are of two types: with zero at center, and with zero at the outside. The stylus in tracing its record removes the wax, exposing the black background. In this way, clear-cut records are obtained, sharper than an ink record and without many of its objectionable features.

Our booklet A G-4 gives a complete description of the G G-9 Recording Demand Meter. Ask for a copy.

# AMERICAN METER COMPANY

INCORPORATED

*The World's Largest Manufacturers of Gas Meters and Allied Apparatus*

*ESTABLISHED 1836*

**GENERAL OFFICES : 105 W. 40TH STREET · NEW YORK, N.Y.**

SALES · ALBANY · BALTIMORE · BOSTON · CHICAGO · DALLAS · DENVER · ERIE · KANSAS CITY
SERVICE · LOS ANGELES · NEW YORK · PHILADELPHIA · PITTSBURGH · SAN FRANCISCO · TULSA

Gas vacuum line of Naylor Pipe at St. Louis, Oklahoma. 40'0" joints, 16" diameter.

# Lowest Cost Per Foot In The Ground

NAYLOR PIPE costs less per foot in the ground than any other pipe carrying standard weight pressures. No other pipe can be laid as cheaply.

Naylor Pipe is the lightest of all pressure pipe. It weighs only half as much as standard weight wrought pipe.

This light weight is a money saving advantage. It means half the freight to pay; half the weight to haul; half as many men needed for handling in the field; speedier laying. These advantages lower your pipe line costs.

Besides light weight, Naylor Pipe is also made of Toncan Iron for greater resistance to rust and corrosion. Longer life of the pipe means fewer renewals..consequently, lower maintenance costs.

Lay your next pipe line at the lowest cost per foot in the ground. Naylor Pipe will help you to do it.

NAYLOR PIPE COMPANY, Main Office & Plant, 1230 E. 92nd St., CHICAGO

SALES OFFICES

25 Church St., New York Witherspoon Bldg., Philadelphia 1500 Cadillac Sq. Bldg., Detroit 507 Philtower Bldg., Tulsa 601 Post-Dispatch Bldg., Houston

DUCOMMUN CORPORATION
LOS ANGELES SAN FRANCISCO
Exclusive Distributors:
California, Arizona, Nevada and Utah

MONTREAL, CANADA
Mechanical Equipment Co.,
New Birks Building

TONCAN COPPER

# Naylor Pipe

Mo-lyb-den-um IRON

Standardized Naylor Pipe is made in sizes 6" to 12" I. D. and 14" to 20" O. D. in any uniform length desired up to 40' 0". Ends made to wrought pipe standards for all types of coupling.

Where corrosion resistance is not a factor, Naylor Pipe can be furnished in steel.

Toncan Copper Molybdenum Iron is a development of Central Alloy Steel Corporation, the world's largest and most highly specialized alloy steel producers. It possesses a superior corrosion resistance, making it the favored pipe material.

# *How many years of service?*

You have probably thought of the service built into a valve as something like the horse-power in an engine. Something that can't be seen at a glance—yet can be pretty closely figured.

You are both right and wrong. Much can be determined by examination of the mechanical construction. Very little can the purchaser know of the material, methods of building, inspection or tests by the manufacturer.

A better valve than the Darling Gate Valve cannot be made. It is built upon the soundest mechanical principles. It is made of the finest metals and with the most exacting workmanship, inspections and tests. Yet the Darling Gate Valve costs you but little more than ordinary valves.

**DARLING VALVE & MANUFACTURING CO.**

**Williamsport, Pa.**

**New York Chicago Oklahoma City Houston**

# DARLING
## GATE VALVES

CONSTANT, uniform motion, combined with proper heat distribution, assures a thorough and even bake, for all baking operations. Eight distinctive advantages make McDonald-made, Meek Reel Ovens the choice of thousands of bakers all over the world for the past quarter of a century. Let us solve your baking problems. Complete information on request.

**THE BRUCE McDONALD CO.**

2015 Washington St. Kansas City, Mo.

*SHOW IT*

*and*

*YOU'LL SELL IT!*

No one likes to lug or hug a dirty ash can. No one likes uneven house temperatures. That—and the efficiency of the Roberts Controlled Gas Heating Unit—reasonable cost of installation and operation—you can't help selling it if you show it.

**MOST HEAT PER DOLLAR**

**ROBERTS-GORDON APPLIANCE CORP.**

Delaware Avenue at Tupper Street

CURTISS BUILDING, BUFFALO, N. Y.

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LET THE WEATHER BE YOUR FURNACE MAN
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MAKES WASHDAY EASIER
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*PAINT*

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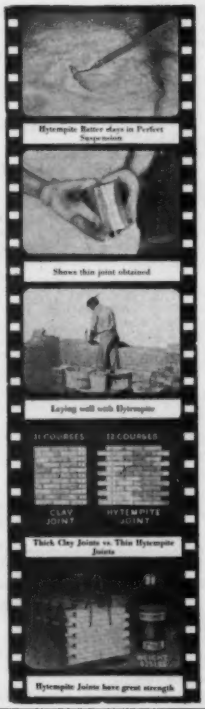
# Don't Figure Refractory Costs

## on a basis of price per thousand or price per pound




When you buy or specify materials for furnace wall construction and repairs consider—

**First,** Quality and Long Life.

**Second,** Cost per year of service including all labor costs.

Good firebrick laid with fire clay or inferior bonding material is a poor investment. Fire clay is merely a filler and doesn't bond the brick.

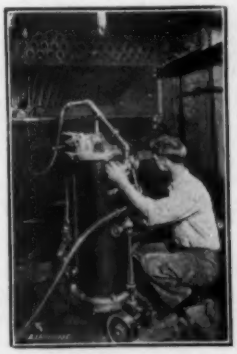
# HYTEMPITE

(Reg. U. S. Pat. Off.)

"The standard for comparison in high temperature cements." Makes thin, tight joints throughout the furnace wall. It resists destruction from constant vibration and allows furnace operation at high temperatures for long periods without frequent shutting down for repairs.

When repairs are necessary crushed old fire brick bonded with HYTEMPITE are used for hot or cold patching.

Rapid repairs to hot furnaces are made with the Quigley Refractory Gun. It shoots premixed materials at any point in wall or arch. Hundreds of users of the Quigley Gun testify as to patching economies with this equipment. Let us send you information on patching and baffling.



Repairing Baffles with Quigley Refractory Gun (Patented)

HYTEMPITE is carried in stock by Quigley agents in every industrial center throughout the United States and at many foreign points. Immediate delivery. Expert advice is at your service.

**QUIGLEY** FURNACE SPECIALTIES **COMPANY** INC.

56 West 45th Street New York

REFRACTORY MATERIALS FOR FURNACE CONSTRUCTION AND MAINTENANCE
ACID PROOF CEMENTS ACID AND ALKALI PROOF COATINGS

*Stock and Service through Agents in Every Industrial Center*

# MITCHELL

## ELECTRIC VIBRATING SCREEN

**Especially adaptable to the screening of coal and coke. In the re-screening of coke, the terrific vibrations, occurring 3,600 times a minute, remove all breeze at the lowest cost per ton. It requires minimum floor space and head room. It is self-contained, dust and water proof. Requires less than ¾ H. P. per standard screen.**

WE DESIGN AND BUILD:

**Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope.**

**C.W.HUNTCO.Inc.**

WEST NEW BRIGHTON,
STATEN ISLAND, N. Y.

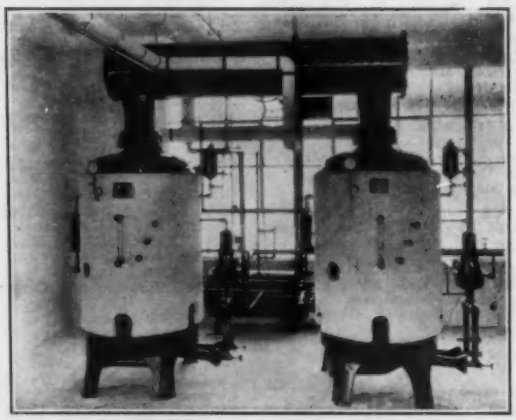
Chicago - Montreal - Boston

HUNT

**Gas** LATTNER **Fired**

# BOILERS

HIGH PRESSURE



**Built in all sizes from ¾ to 30 H.P., with dual or triple** installations for greater horsepower requirements.

***Automatic—Efficient—Dependable***

**P. M. LATTNER MFG. COMPANY**

**Cedar Rapids, Ia.**

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The Western Gas Construction Company.

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Kuth's Steam Accumulator Co.
A. O. Smith Corp.
Smoot Engineering Corp.
The Western Gas Construction Company.
United Engineers & Constructors, Inc.

**ACETYLENE**
The Prest-O-Lite Co., Inc.
Oxweld Acetylene Co.

**ACETYLENE EQUIPMENT**
American Lava Corp.

**ACCOUNTING MACHINES**
Remington Rand, Inc.

**AMMONIA CONCENTRATORS**
Bartlett Hayward Co.
Cruse-Kemper Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

**AMMONIA CONCENTRATED LIQUOR PLANTS**
The Gas Machinery Co.
Semet-Solvay Engineering Corp.

**AMMONIA PIPE**
National Tube Company.

**AMMONIA RECOVERY APPARATUS**
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

**AMMONIA STILLS**
Bartlett-Hayward Co.
Cruse-Kemper Co
The Gas Machinery Co.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
John S. Unger.
The Western Gas Construction Company.

**AMMONIA TEST**
American Meter Co.

**APPRAISALS & INVENTORIES**
Stacey Bros. Gas Construction Co.
United Engineers & Constructors, Inc.

**APPARATUS**
Laboratory Experimental
American Meter Co.
Service
American Meter Co.

**ASH STORAGE BINS**
C. W. Hunt Co., Inc.
Semet-Solvay Engineering Corp.
Riter-Conley Co.
The Stacey Mfg. Co.

**AUDITS**
United Engineers & Constructors, Inc.

**AUTOMATIC CONTROLS FOR WATER GAS APP.**
The Brown Instrument Co.
United Engineers & Constructors, Inc.

**AUTOMATIC RAILWAYS**
C. W. Hunt Co., Inc.

**BACK PRESSURE VALVES**
Connelly Iron Sponge & Governor Co.

**BACKRUN GAS EQUIPMENT**
Semet-Solvay Engineering Corp.

**BAGS**
Safety Gas Main Stopper Co.

**BAROMETERS**
Connelly Iron Sponge & Governor Co.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.
Taylor Instrument Companies

**BENCHES**
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Gas Machinery Co.
The Stacey Mfg. Co.
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The Western Gas Construction Company.

**BENZOL**
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Indugas, Inc.
The Koppers Construction Co.

**BENZOL RECOVERY PLANTS**
Semet-Solvay Engineering Corp.

**BLOWERS**
Connersville Blower Co., The.
Gas Engineering Co.
The Gas Machinery Co.
Pittsburgh Equitable Meter Co.
The P. H. & F. M. Roots Company.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

**BLUE GAS PLANT**
Bartlett-Hayward Co.
Indugas, Inc.
Gas Engineering Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

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**BOILERS—WASTE HEAT**
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Combustion Engineering Corpn.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
United Engineers & Constructors, Inc.
West Gas Improvement Co.
The Western Gas Construction Company.

**BOOKKEEPING MACHINES**
Remington Rand, Inc.

**BOOSTERS**
Connelly Iron Sponge & Governor Co.
Connersville Blower Co., The

**BRICK**
Fire and Checker
Botfield Refractories Co.
The Gas Machinery Co.
General Refractories Co.
Improved Equipment Co.-Russell Eng. Corp.
United Engineers & Constructors, Inc.
United States Refractories Corp.
Silica
The Gas Machinery Co.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Company.
United States Refractories Corp.
High Alumina
General Refractories Co.

**BRUSHES, PIPE CLEANING**
Safety Gas Main Stopper Co.

**B. T. U. INDICATORS**
Alpha-Lux Co.

**BUILDINGS**
United Engineers & Constructors, Inc.

**BURNERS (Industrial)**
American Lava Corp.
Columbia Burner Co.
Conversion
Conversion House Heating
Columbia Burner Co.
Roberts Gas Burner Corp.
Fuel

**BY-PRODUCT COKE**
Semet-Solvay Co.

**BY-PRODUCT PLANTS**
Bartlett-Hayward Co.
Indugas, Inc.
The Gas Machinery Co.
International Coal Carbonization Co
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
West Gas Improvement Co.

**CABLE RAILWAYS**
C. W. Hunt Co., Inc.
Alpha-Lux Company.
American Meter Co.
Consolidated Ashcroft Hancock Inc., Co.

**CALORIMETERS**
John J. Griffin & Company.

**CALORIMETER ACCESSORIES**
American Meter Co.

**CARBIDE**
Union Carbide Sales Co.

**CARBONIZATION**
The Gas Machinery Co.
Low Temperature
International Coal Carbonization Co.

**CARBURETTED WATER GAS**
The Western Gas Construction Co.

**CARBURETTED WATER GAS PLANTS**
Bartlett-Hayward Co.
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.

**CARS**
C. W. Hunt Co., Inc.

**CASINGS, SEAMLESS STEEL**
National Tube Co.

**CAST IRON PIPE**
Bell
Cast Iron Pipe Research Ass'n.
Spigot
Cast Iron Pipe Research Ass'n.

**CEMENTS**
Acid-proof
Botfield Refractories Company.
General Refractories Co.
Quigley Furnace Spec. Co., Inc.
Firebrick
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
United States Refractories Corp.
High Temperature
Alpha-Lux Company.
Botfield Refractories Company.
General Refractories Co.
E. J. Lavino & Co.
Quigley Furnace Spec. Co., Inc.
Refractory & Engineering Corp.
United States Refractories Corp.
Refractory
Botfield Refractories Company.
General Refractories Co.
Improved Equipment-Russell Engineering Corp.
E. J. Lavino & Co.
General Refractories Co.
United States Refractories Corp.
Silica
General Refractories Co.

**CHAMBER OVENS**
United Engineers & Constructors, Inc.

**CHARGING MACHINERY**
Bartlett-Hayward Co.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

**CHUTES**
C. W. Hunt Co., Inc.
Riter-Conley Company.
Robins Conveying Belt Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.

**CLAMPS (PIPE)**
S. R. Dresser Mfg. Co.

**CLOCKS & WATCHES, Stop**
American Meter Co.

**COALS**
Boone County Coal Corpn.
Logan County Coal Corp.
Westmoreland Coal Co

**COAL GAS APPARATUS**
Bartlett-Hayward Co.
Indugas, Inc.
The Gas Machinery Co.
Improved Equipment-Russell Engineering Corp.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
West Gas Improvement Company.
The Western Gas Construction Company.

**COAL & COKE BINS CASTINGS**
The Koppers Construction Co.
The Stacey Mfg. Co.

**COAL AND COKE HANDLING MACHINERY**
Bartlett-Hayward Co.
Dry Quenching Equipment Corp.
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.
United Engineers & Constructors, Inc.

**COAL TAR PRODUCTS**
International Combustion, Tar, and Chemical Corpn.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

**COAL TUBES**
C. W. Hunt Co., Inc.
Meter
American Meter Co.
Superior Meter Co.
Service
American Meter Co.

**COKE CRUSHERS**
The Koppers Construction Co.

**COKE QUENCHING**
Dry Quenching Equipment Corp.
The Koppers Construction Co.
Semet-Solvay Engineering Corp.

**COKE RECLAMATION SYSTEMS**
C. W. Hunt Co., Inc.

**COMPUTERS**
Heating Value
United Engineers & Constructors, Inc.

**CONDENSERS**
Bartlett-Hayward Co.
Cruse-Kemper Co.
Gas Engineering Co.
The Gas Machinery Co.
Isbell-Porter Company.
Semet-Solvay Engineering Corp.
The Stacey Mfg. Co.
The Western Gas Construction Company.
High Duty
Stacey Bros. Gas Const. Co.
United Engineers & Constructors, Inc.

**CONTRACTORS' TUBS**
C. W. Hunt Co., Inc.

**CONTROLS**
The Bristol Company.
The Brown Instrument Co.
Robertshaw Thermostat Co.
Time-O-Stat Controls Co.
Combustion
Smoot Engineering Corp.
Gas Pressure
Smoot Engineering Corp.
Gas Producer
Smoot Engineering Corp.
Hot Water Heat System
The Cleveland Heater Company.
Water Gas Machine
Smoot Engineering Corp.

**CONVEYORS**
C. W. Hunt Co., Inc.
Isbell-Porter Company.
The Koppers Construction Co.

**COOLERS**
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.
Air
Andale Company.
Ammonia Liquor
Andale Company.
Gas
Andale Company.
Oil
Andale Company.

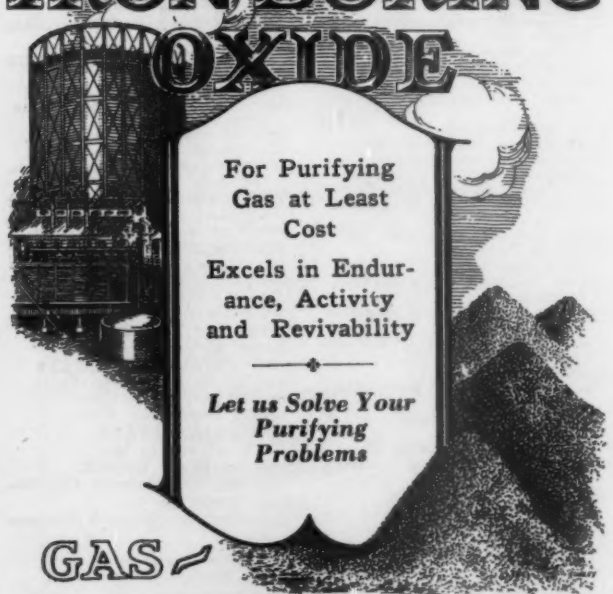
**COOLING COILS**
The Gas Machinery Co.
Semet-Solvay Engineering Corp.
The Western Gas Construction Company.

# COOLING GAS AFTER COMPRESSION

Reduces drip pumpage. Eliminates leakage from pipe expansion and contraction by stabilizing the temperature of the pipe. We build coolers to reduce gas temperatures to as close as within 5 degrees of the cold water temperature and with small cooling water requirements.

ANDALE COMPANY
1600 ARCH STREET
PHILADELPHIA

IRON BORING OXIDE



For Purifying Gas at Least Cost

Excels in Endurance, Activity and Revivability

*Let us Solve Your Purifying Problems*

GAS PURIFYING MATERIALS COMPANY INC.

FOOT OF HALSEY STREET . . . . LONG ISLAND CITY
NEW YORK
BRANCH YARD—PROVIDENCE, R.I.


## TRADE CATALOGS

*(Continued from page 100)*

REX DUAL BURNERS
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EDITOR, AMERICAN GAS JOURNAL, 53 PARK PLACE, NEW YORK

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Pittsburgh Equitable Meter Co.
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The C. M. Kemp Mfg. Co.
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Bartlett-Hayward Co.
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Cruse-Kemper Co.
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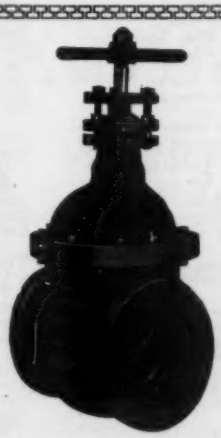

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The P. H. & F. M. Roots Company.
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American Meter Co.
Lambert Meter Co.
Superior Meter Co.
**Service Cleaner**
American Meter Co.
John J. Griffin & Company.
Lambert Meter Co.
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Superior Meter Co.
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Connersville Blower Co., The
The P. H. & F. M. Roots Company.
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Gas Engineering Co.
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Isbell-Porter Company.
The Koppers Construction Co.
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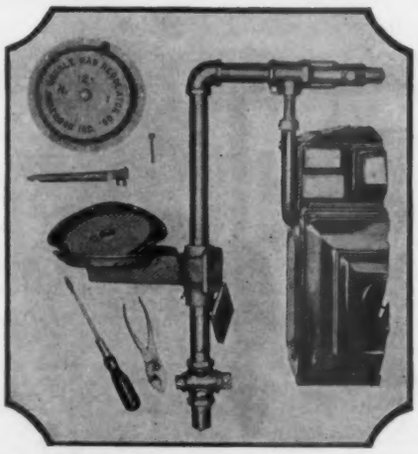
Stacey Bros. Gas. Const. Co.
The Stacey Mfg. Co.
Riter-Conley Company.
United Engineers & Constructors Inc.
The Western Gas Construction Company

GROBLE REGULATORS & GOVERNORS



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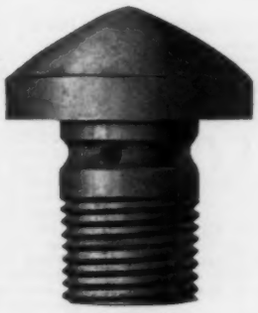

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Connelly Iron Sponge & Governor Co.
The Gas Machinery Co.
Gas Purifying Materials Co., Inc
The Koppers Construction Co.
E. J. Lavino & Co.

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Stacey Bros. Gas Const. Co.
The Stacey Mfg. Co.
United Engineers & Constructors, Inc.
The Western Gas Construction Company.

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Maryland Meter Works
The Bristol Company.
The Western Gas Construction Company.
Indicating
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.
Radiation
Taylor Instrument Companies.
Recording
The Gas Machinery Co.
Taylor Instrument Companies.
United Engineers & Constructors, Inc.

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American Gas Products Corp.

**RANGES—GAS**
American Stove Co.

**RECORDERS—LIQUID LEVEL**
The Brown Instrument Co.

**RECORDING DEMAND METERS**
The Brown Instrument Co.
Lambert Meter Co.
Maryland Meter Works

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The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
E. J. Lavino & Co.
Quigley Furnace Spec. Co. Inc.
Refractory & Engineering Corp.
United States Refractories Corp.

**REFRACTORY GUN**
Botfield Refractories Company
Quigley Furnace Spec. Co. Inc.

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Botfield Refractories Company
The Gas Machinery Co.
General Refractories Co.
Improved Equipment—Russell Engineering Corp.
Quigley Furnace Spec. Co. Inc.
Refractory & Engineering Corp.
United Engineers & Constructors Inc.
The Western Gas Construction Company
United States Refractories Corp.

**REFRIGERATORS—GAS**
Servel Sales, Inc.

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American Meter Co.
The Brown Instrument Co.
The Chaplin Fulton Mfg. Co.
Connersville Co., The
Connelly Iron Sponge & Governor Co.
Groble Gas Regulator Co.
Isbell-Porter Co.
Pittsburgh Equitable Meter Co.
Reynolds Gas Regulator Co.
Robertshaw Thermostat Co.
Smoot Engineering Corp.
The Sprague Meter Co.
Taylor Instrument Companies
Air Pressure
Time-O-Stat Controls Co.
Smoot Engineering Corp.
Coke Oven Suction Main
Smoot Engineering Corp.
Exhauster
Smoot Engineering Corp.
Furnace Pressure
Smoot Engineering Corp.
Oven
American Stove Co.
Steam Pressure
Smoot Engineering Corp.

**REPAIR PARTS**
Lambert Meter Co.

**RESPERATING OUTFITS**
Connelly Iron Sponge & Governor Co.

**RETORTS**
Horizontal and Inclined
Improved Equipment—Russell Engineering Corp.
Vertical
United Engineers & Constructors Inc.
West Gas Improvement Co.
Silica and Clay
Improved Equipment—Russell Engineering Corp.
The Gas Machinery Company
United States Refractories Corp.

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Alpha-Lux Company
Botfield Refractories Company
General Refractories Co.
The Gas Machinery Co.
Improved Equipment—Russell Engineer Corp.
Quigley Furnace Spec. Co. Inc.
United States Refractories Corp.

**REVERSE FLOW GOVERNORS**
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**REYNOLDS**
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Reynolds Gas Regulator Co.

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Southwestern Pipe Joint & Eng. Co. Inc.

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The Gas Machinery Co.
Isbell-Porter Co.
Semet-Solvay Engineering Corp.
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The Stacey Mfg. Co.
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Gas Purifying Materials Co. Inc.

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Smoot Engineering Corp.
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Connelly Iron Sponge & Governor Co.
Safety Gas Main Stopper Co.

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The Bristol Company.
Consolidated Ashcroft Hancock Co., Inc.
Precision Thermometer & Instrument Company.

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The Western Gas Construction Company.
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Stacey Bros. Gas Const. Co.
High Pressure
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Pittsburgh Equitable Meter Co.
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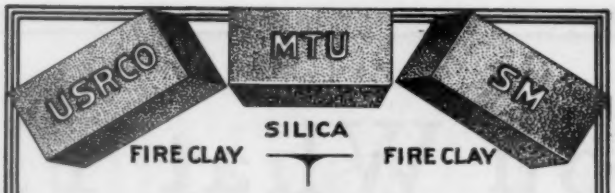


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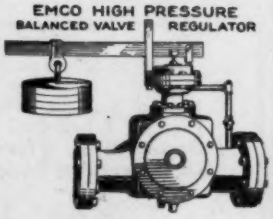
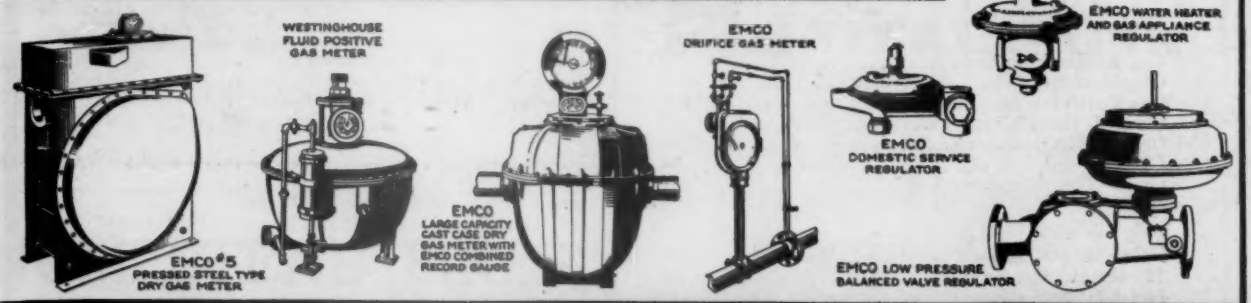
EMCO—*wherever you go*






# PITTSBURGH EQUITABLE METER COMPANY

**MAIN OFFICE AND WORKS PITTSBURGH, PA.**

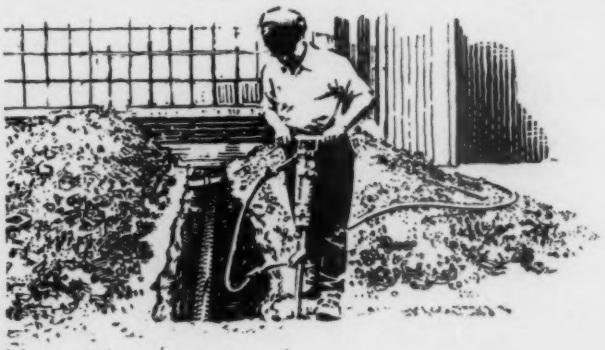
NEW YORK CHICAGO COLUMBIA, S.C. LOS ANGELES DALLAS
TULSA SEATTLE KANSAS CITY SALT LAKE CITY

LE N '30

# Possibly you are too accustomed to trouble

LEAKS and the maintenance costs they entail are common experiences in the routine of operation. You may get so used to them that you accept them as a necessary evil. Don't however, overlook the fact that practically all the leaks that occur in Services are caused by corrosion and that trouble from this cause can be eliminated, easily and cheaply.

A new method of dipping small diameter pipe makes it possible to apply *Bitumastic Enamel* at a cost approximating one cent per inch of diameter per linear foot. This dense, tough, impervious coating excludes all moisture, all acids and alkalis and prevents the picking up of stray currents that produce electrolysis. It eliminates corrosion and extends the life of the buried metal indefinitely.

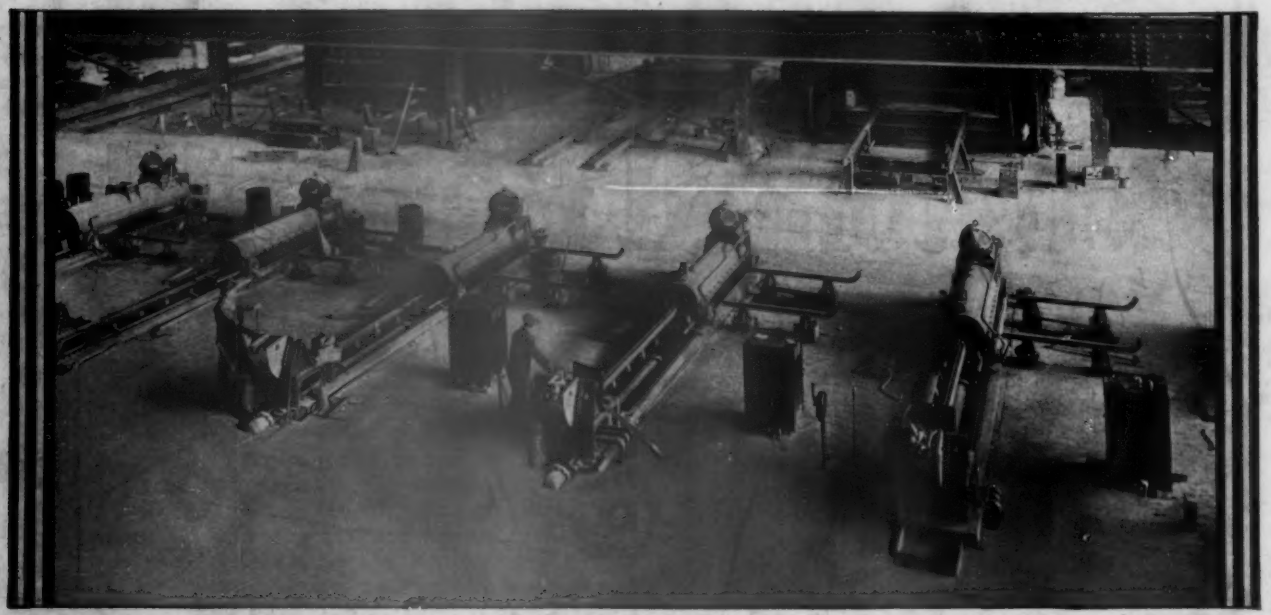


Over one hundred gas companies now protect their buried pipe with *Bitumastic Enamel*. This new method of application makes its protection available to both small and large properties and on both large and small pipe.

***Send for bulletin 272. It gives complete information about enameling small diameter pipe, including simple instructions for laying out the equipment.***

## BITUMASTIC
REG. U.S. PAT. OFF.
## ENAMEL

**Wailes Dove-Hermiston Corporation**
**17 Battery Place, New York**
Philadelphia Cleveland Chicago Houston Tulsa San Francisco



# Centrifugal casting in these machines gives deLavaud pipe...

***100% greater tensile strength***
***65% greater transverse strength***
***25% greater bursting strength***

**IN a series of strength tests on deLavaud Pipe, conducted by a disinterested testing laboratory, the results shown above represent the strength of deLavaud as compared with pit cast pipe.**

**While these percentages appear startling at first glance, a careful comparison of deLavaud metal with pit cast will help to convince you of their authenticity. For deLavaud Pipe metal will appear dense and extremely close-grained, while the structure of pit cast pipe metal will be coarse and crystalline.**

**deLavaud Pipe is made by pouring molten metal into a revolving cylindrical mould. Centrifugal force holds the iron against the mould and drives out slag and gas bubbles *with a force 40 times greater than gravity.* Thus deLavaud metal is dense and fine in structure. And, it is remarkably free from weakening impurities.**

**In addition, the action of the water-cooled deLavaud mould and the subsequent annealing further improve the physical properties and the microstructure of the metal.**

**Let us send you all of the facts and figures on deLavaud Pipe; also the deLavaud Handbook which gives useful information about types of joints and dimension tables.**

*Cast iron pipe made by this Company bears the "Q-check" trademark of The Cast Iron Pipe Research Association.*

# United States Pipe and Foundry Co., Burlington, New Jersey

***Sales Offices:*** New York, Philadelphia, Pittsburgh, Cleveland, Buffalo, Chicago, Dallas, Birmingham, Kansas City, Minneapolis, Seattle, San Francisco, Los Angeles

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